ACADEMIC REGULATIONS

COURSE STRUCTURE AND

DETAILED SYLLABUS

INFORMATION TECHNOLOGY

B.TECH 4 YEAR UG COURSE

(Applicable for the batches admitted from 2016-2017)

REGULATION: R16

(I, II, III & IV Year Syllabus)

J.B. INSTITUTE OF ENGINEERING & TECHNOLOGY
UGC AUTONOMOUS
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J.B. INSTITUTE OF ENGIEERING & TECHNOLOGY
UGC AUTONOMOUS

Institute Vision & Mission

Vision

To be a centre of excellence in engineering and management education, research and application of knowledge to benefit society with blend of ethical values and global perception.

Mission:

- To provide world class engineering education, encourage research and development.
- To evolve innovative applications of technology and develop entrepreneurship.
- To mould the students into socially responsible and capable leaders.

DEPARTMENT OF INFORMATION TECHNOLOGY

Department Vision and Mission

Vision

To become a centre of excellence in Information Technology and prepare students as professionals, by carrying high end research to meet the emerging trends to benefit the society.

Mission

- To impart quality education with multidisciplinary applications to solve complex problems concerning the industry.
- To create research environment in Information Technology and prepare students to accept futuristic global challenges by encouraging continuous learning.
- To encourage entrepreneurship for innovation, inculcate sense of social responsibility and ethical values.

DEPARTMENT OF INFORMATION TECHNOLOGY

B.Tech. Information Technology

PEOs and PSOs

Program Educational Objectives (PEOs):	
PEO1	Be a competent software engineer/developer either as an individual or as a team player in IT industry and allied branches providing viable solutions.
PEO2	Initiate life-long learning to acquire new technologies and adapt to the changing needs of IT industry through self-learning for professional development.
PEO3	Exhibit professional excellence through ethics, soft skills and leadership qualities as a responsible citizen with societal interest.

Program Specific Outcomes (PSOs):	
PSO1	Design, Develop, Test and Manage reliable and efficient application software systems as per user requirements.
PSO2	Acquaint with the contemporary trends and issues in industry or research settings by giving innovative novel solutions to existing problems.

J.B. INSTITUTE OF ENGINEERING AND TECHNOLOGY (JBIET)
UGC AUTONOMOUS
Bhaskar Nagar, Moinabad, Hyderabad – 500075, Telangana, India

ACADEMIC REGULATIONS FOR B.TECH. REGULAR STUDENTS

WITH EFFECT FROM THE ACADEMIC YEAR 2016-17 (R-16)

1.0 Under-Graduate Degree Programme in Engineering & Technology (UGP in E&T)

1.1 JBIET offers a 4-year (8 semesters) **Bachelor of Technology** (B.Tech.) degree programme, under Choice Based Credit System (CBCS) with effect from the academic year 2016-17 in the following branches of Engineering:

Sl. No.	Branch
1	Civil Engineering
2	Electrical and Electronics Engineering
3	Mechanical Engineering
4	Electronics and Communication Engineering
5	Computer Science and Engineering
6	Information Technology
7	Electronics and Computer Engineering
8	Mining Engineering

2.0 Eligibility for Admission

2.1 Admission to the under graduate programme shall be made either on the basis of the merit rank obtained by the qualified candidate in entrance test conducted by the Telangana State Government (EAMCET) or on the basis of any other order of merit approved by the University, subject to reservations as prescribed by the government from time to time.

2.2 The medium of instructions for the entire under graduate programme in E&T will be **English** only.

3.0 B.Tech. Programme structure

3.1 A student after securing admission shall pursue the under graduate programme in B.Tech. in a minimum period of **four** academic years (8 semesters), and a maximum period of **eight** academic years (16 semesters) starting from the date of commencement of first year first semester, failing which student shall forfeit seat in B.Tech course.

Each semester is structured to provide 24 credits, totalling to 192 credits for the entire B.Tech. programme. Each student shall secure 192 credits (with CGPA ≥ 5) required for the completion of the under graduate programme and award of the B.Tech. degree.

3.2 UGC/ AICTE specified definitions/ descriptions are adopted appropriately for various terms and abbreviations used in these academic regulations/ norms, which are listed below.

3.2.1 Semester scheme

Each under graduate programme is of 4 academic years (8 semesters) with the academic year being divided into two semesters of 22 weeks (≥ 90 instructional days) each, each semester having - '**Continuous Internal Evaluation (CIE)**' and '**Semester End Examination (SEE)**'. **Choice Based Credit System (CBCS)** and **Credit Based Semester System (CBSS)** as indicated by UGC and curriculum / course structure as suggested by AICTE are followed.

3.2.2 Credit courses

All subjects/ courses are to be registered by the student in a semester to earn credits which shall be assigned to each subject/ course in an L: T: P: C (lecture periods: tutorial periods: practical periods: credits) structure based on the following general pattern.

1. One credit for one hour/ week/ semester for theory/ lecture (L) courses.
2. One credit for two hours/ week/ semester for laboratory/ practical (P) courses or Tutorials (T).

Courses like Environmental Studies, Professional Ethics, Gender Sensitization lab are identified as **mandatory courses**. These courses **will not carry any credits**.

3.2.3 Subject Course Classification

All subjects/ courses offered for the under graduate programme in E&T (B.Tech. degree programmes) are broadly classified as follows. JBIET has followed almost all the guidelines issued by AICTE/UGC.

S. No.	Broad Course Classification	Course Group/ Category	Course Description
1	Foundation Courses (FnC)	BS – Basic Sciences	Includes mathematics, physics and chemistry subjects
2		ES - Engineering Sciences	Includes fundamental Engineering subjects
3		HS – Humanities and Social sciences	Includes subjects related to humanities, social sciences and management
4	Core Courses (CoC)	PC – Professional Core	Includes core subjects related to the parent discipline/ department/ branch of Engineering.
5		Project Work	B.Tech. project or UG project or UG major project
6		Industrial training/ Mini- project	Industrial training/ Internship/ UG Mini-project/Mini-project

7		Seminar	Seminar/ Colloquium based on core contents related to parent discipline/ department/ branch of Engineering.
8	Elective Courses (EℓC)	PE – Professional Electives	Includes elective subjects related to the parent discipline/ department/ branch of Engineering.
9		OE – Open Electives	Elective subjects which include interdisciplinary subjects or subjects in an area outside the parent discipline/ department/ branch of Engineering.
10	Mandatory Courses (MC)	-	Mandatory courses (non-credit)

4.0 Course registration

4.1 A 'faculty advisor or counsellor' shall be assigned to a group of 15 students, who will advise student about the under graduate programme, its course structure and curriculum, choice/option for subject s/ courses, based on their competence, progress, pre-requisites and interest.

4.2 The academic section of the college invites '**registration forms**' from students before the beginning of the semester through 'on-line registration', ensuring 'date and time stamping'. The on-line registration requests for any 'current semester' shall be **completed before the commencement of SEEs (Semester End Examinations) of the 'preceding semester'**.

4.3 A student can apply for **on-line** registration, **only after** obtaining the '**written approval**' from faculty advisor/counsellor, which should be submitted to the college academic section through the Head of the Department. A copy of it shall be retained with Head of the Department, faculty advisor/ counsellor and the student.

4.4 A student may be permit ted to register for the subjects/ courses of **choice** with a total of 24 credits per semester (minimum of 20 credits and maximum of 28 credit s per semester and permitted deviation of ± 17%), based on **progress** and SGPA/ CGPA, and completion of the '**pre-requisites'** as indicated for various subjects/ courses, in the department course structure and syllabus contents. However, a **minimum** of 20 credits per semester must be registered to ensure the '**studentship**' in any semester.

4.5 Choice for 'additional subjects/ courses' to reach the maximum permissible limit of 28 credits (above the typical 24 credit norm) must be clearly indicated, which needs the specific approval and sig nature of the faculty advisor/ counsellor.

4.6 If the student submits ambiguous choices or multiple options or erroneous entries during **on-line** registration for the subject(s) / course(s) under a given/ specified course group/ category as listed in the course structure, only the first mentioned subject/ course in that category will be taken into consideration.

4.7 Subject/ course options exercised through **on-line** registration are fin al and **cannot** be changed or inter-changed; further, alternate choices also will not be considered. However, if the subject/ course that has already been listed for registration b y the Head of the Department in a semester could not be offered due to any unforeseen or unexpected reasons, then the student shall be allowed to have alternate choice either for a new subject (subject to offering of such a subject), or for another existing subject (subject to availability of seats). Such alternate arrangements will be made by the head of the department, with due notification and time-framed schedule, within the **first week** after the commencement of class-work for that semester.

4.8 Dropping of subjects/courses may be permitted, only after obtaining prior approval from the faculty advisor/counsellor (subject to retaining a minimum of 20 credits), '**within a period of 15 days**' from the beginning of the current semester.

4.9 Open electives: The students have to choose one open elective (OE -I) in III year I semester, one (OE-II) in III year II semester, and one (OE-III) in IV year II semester, from the list of open electives given. However, the student cannot opt for an open elective subject offered by their own (parent) department, if it is already listed under any category of the subjects offered by parent department in any semester.

4.10 Professional electives: students have to choose professional elective – I (PE-I), professional elective – II (PE-II) in III year II semester, Professional electives – III (PE-III), Professional electives – IV(PE-IV) in IV year I semester, Professional electives – V (PE-V), Professional electives – VI (PE-VI) in IV year II semester, from the list of professional electives given. However, the students may opt for professional elective subjects offered in the related area.

5.0 Subjects/courses to be offered

5.1 A typical section (or class) strength for each semester shall be 60.

5.2 A subject/ course may be offered to the students, **only if** a minimum of 20 students (1/3 of the section strength) opt for it. The maximum strength of a section is limited to 80 (60 + 1/3 of the section strength).

5.3 More than **one faculty member** may offer the **same subject** (lab/ practical may be included with the corresponding theory subject in the same semester) in any semester. However, selection of choice for students will be based on - '**first com e first serve** basis and CGPA criterion' (i.e. the first focus shall be on early **on-line entry** from the student for registration in that semester, and the second focus, if needed, will be on CGPA of the student).

5.4 If more entries for registration of a subject come into picture, then the Head of Department concerned shall decide, whether or not to offer such a subject/ course for **two (or multiple) sections**.

6.0 Attendance requirements:

6.1 A student shall be eligible to appear for the semester end examinations, if student acquires a minimum of 75% of attendance in aggregate of all the subjects/ courses (excluding attendance in mandatory courses Environmental Science, Professional Ethics, Gender Sensitization Lab, NCC/ NSO and NSS) for that semester.

6.2 Shortage of attendance in aggregate up to 10% (65% and above, and below 75%) in each semester may be condoned by the college academic committee on genuine and valid grounds, based on the student's representation with supporting evidence.

6.3 A stipulated fee shall be payable towards condoning of shortage of attendance.

6.4 Shortage of attendance below 65% in aggregate shall in **no** case be condoned.

6.5 Students whose shortage of attendance is not condoned in any semester are not eligible to take their end examinations of that semester. They get detained and their registration for that semester shall stand cancelled. They will not be promoted to the next semester. They may seek re-registration for all those subjects registered in that semester in which student was detained, by seeking re-admission into that semester as and when offered; in case if there are any professional electives and/ or open electives, the same may also be re-registered if offered. However, if those electives are not offered in later semesters, then alternate electives may be chosen from the **same** set of elective subjects offered under that category.

6.6 A student fulfilling the attendance requirement in the present semester shall not be eligible for readmission into the same class.

7.0 Academic requirements

The following academic requirements have to be satisfied, in addition to the attendance requirements mentioned in item no.**6.**

7.1 A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/course, if student secures not less than 35 % marks (26 out of 75 marks) in the semester end examination, and a minimum of 40% of marks in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together; in terms of letter grades, this implies securing **'C'** grade or above in that subject/ course.

7.2 A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to UG mini-project and seminar, if student secures not less than 40% marks (i.e. 40 out of 100 allotted marks) in each of them. The student would be treated as failed, if student (i) does not submit a report on UG mini-project, or does not make a presentation of the same before the evaluation committee as per schedule, or (ii) does not present the seminar as required in the IV year I Semester, or (iii) secures less than 40% marks in UG mini-project/ seminar evaluations.

Student may reappear once for each of the above evaluations, when they are scheduled again; if student fails in such 'one reappearance' evaluation also, student has to reappear for the same in the next subsequent semester, as and when it is scheduled.

7.3 Promotion Rules

S. No.	Promotion	Conditions to be fulfilled
1	First year first semester to first year second semester	Regular course of study of first year first semester.
2	First year second semester to second year first semester	i. Regular course of study of first year second semester. ii. Must have secured at least 24 credits out of 48 credits i.e., 50% of credits up to first year second semester from all the relevant regular and supplementary examinations, whether the student takes those examinations or not.
3	Second year first semester to second year second semester	Regular course of study of second year first semester.
4	Second year second semester to third year first semester	i. Regular course of study of second year second semester. ii. Must have secured at least 58 credits out of 96 credits i.e., 60% of credits up to second year second semester from all the relevant regular and supplementary examinations, whether the student takes those examinations or not.
5	Third year first semester to third year second semester	Regular course of study of third year first semester.
6	Third year second semester to fourth year first semester	i. Regular course of study of third year second semester. ii. Must have secured at least 86 credits out of 144 credits i.e., 60% of credits up to third year second semester from all the relevant regular and supplementary examinations, whether the student takes those examinations or not.
7	Fourth year first semester to fourth year second semester	Regular course of study of fourth year first semester.

7.4 A student shall register for all subjects covering 192 credits as specified and listed in the course structure, fulfils all the attendance and academic requirements for 192 credits, 'earn all 192 credits' by securing SGPA $\geq$ 5.0 (in each semester) and CGPA (at the end of each successive semester) $\geq$ 5.0 to successfully complete the under graduate programme.

7.5 After securing the necessary 192 credits as specified for the successful completion of the entire under graduate programme, the student can avail exemption of two subjects up to 6 credits, that is, one open elective and one professional elective subject or two professional elective subjects for optional drop out from these 192 credits earned;

resulting in 186 credits for under graduate programme performance evaluation, i.e., the performance of the student in these 186 credits shall alone be taken into account for the calculation of 'the final CGPA (at the end of under graduate programme, which takes the SGPA of the IV year II semester into account)' , and shall be indicated in the grade card of IV year II semester. However, the performance of student in the earlier individual semesters, with the corresponding SGPA and CGPA for which grade cards have already been given will not be altered.

7.6 If a student registers for some more '**extra subjects'** (in the parent department or other **departments**/branches of Engineering.) other than those listed subjects totaling to 192 credits as specified in the course structure of his department, the performances in those '**extra subjects**' (although evaluated and graded using the same procedure as that of the required 192 credits) will not be taken into account while calculating the SGPA and CGPA. For such '**extra subjects'** registered, % of marks and letter grade alone will be indicated in the grade card as a performance measure, subject to completion of the attendance and academic requirements as stated in regulations 6 and 7.1 – 7.5 above.

7.7 A student eligible to appear in the end semester examination for any subject/ course, but absent from it or failed (thereby failing to secure **'C'** grade or above) may reappear for that subject/ course in the supplementary examination as and when conducted. In such cases, CIE assessed earlier for that subject/ course will be carried over, and added to the marks to be obtained in the SEE supplementary examination for evaluating performance in that subject.

7.8 A student **detained in a semester due to shortage of attendance, may be re-admitted when the same semester is offered in the next academic year for fulfilment of academic requirement s**. The academic regulations under which student has been readmitted shall be applicable. However, no grade allotments or SGPA/ CGPA calculations will be done for the entire semester in which student has been detained.

7.9 A student detained **due t o lack of credits, shall be promoted to the next academic year only after acquiring the required academic credits.** The academic regulations under which student has been readmitted shall be applicable to him.

8.0 Evaluation - Distribution and Weightage of marks

8.1 The performance of a student in every subject/course (including practical's and UG major project) will be evaluated for 100 marks each, with 25 marks allotted for CIE (Continuous Internal Evaluation) and 75 marks for SEE (Semester End-Examination).

8.2 For theory subjects, during a semester, there shall be two mid-term examinations. Each mid-term examination consists of one objective paper, one descriptive paper and one assignment. The objective paper and the essay paper shall be for 10 m arks each with a total duration of 1 hour 20 minutes (20 minutes for objective and 60 minutes for essay paper). The objective paper is set with 20 bits of multiple choice, fill-in the blanks and matching type of questions for a total of 10 marks. The essay paper shall contain 4 full

questions out of which, the student has to answer 2 questions, each carrying 5 marks. While the first mid-term examination shall be conducted on 50% of the syllabus, the second mid-term examination shall be conducted on the remaining 50% of the syllabus. Five marks are allocated for assignments (as specified by the subject teacher concerned). The first assignment should be submitted before the conduct of the first mid-examination, and the second assignment should be submitted before the conduct of the second mid-examination. The total m arks secured by the student in each mid-term examination are evaluated for 25 marks, and the average of the two mid-term examinations shall be taken as the final marks secured by each student in internals/sessionals. If any student is absent from any subject of a mid-term examination, an on-line test will be conducted for him by the university. The details of the question paper pattern are as follows,

- The end semester examinations will be conducted for 75 marks consisting of two parts viz. i) **Part- A** for 25 marks, ii) **Part - B** for 50 marks.
- Part-A is compulsory question which consists of ten sub-questions. The first five sub-questions are from each unit and carry 2 marks each. The next five sub-questions are one from each unit and carry 3 marks each.
- Part-B consists of five questions (numbered from 2 to 6) carrying 10 marks each.
- Each of these questions is from one unit and may contain sub-questions. For each question there will be an “either” “or” choice, which means that there will be two questions from each unit and the student should answer either of the two questions.

8.3 For practical subjects there shall be a continuous internal evaluation during the semester for 25 sessional marks and 75 semester end examination marks. Out of the 25 marks for internal evaluation, day-to-day work in the laboratory shall be evaluated for 15 marks and internal practical examination shall be evaluated for 10 marks conducted by the laboratory teacher concerned. The semester end examination shall be conducted with an external examiner and the laboratory teacher. The external examiner s hall be appointed from the clusters of colleges which are decided by the examination branch of the university

8.4 For the subject having design and/or drawing, (such as engineering graphics, engineering drawing, machine drawing) and estimation, the distribution shall be 25 marks for continuous internal evaluation (15 marks for day-to-day work and 10 m arks for internal tests) and 75 marks for semester end examination. There shall be two internal tests in a semester and the average of the two shall be considered for the award of marks for internal tests.

8.5 There shall be an UG mini-project, in collaboration with an industry of their specialization. Students will register for this immediately after III year II semester examinations and pursue it during summer vacation. The UG mini -project shall be

submitted in a report form and presented before the committee in IV year I semester. It shall be evaluated for 100 marks. The committee consists of an external examiner, Head of the Department, supervisor of the UG mini-project and a senior faculty member of the department. There shall be no internal marks for UG mini-project

8.6 There shall be a seminar presentation in IV year II semester. For the seminar, the student shall collect the information on a specialized topic, prepare a technical report and submit it to the department. It's hall be evaluated by the departmental committee consisting of Head of the Department, seminar supervisor and a senior faculty member. The seminar report shall be evaluated for 100 marks. There shall be no semester end examination for the seminar.

8.7 Out of a total of 100 m arks for the UG major project, 25 marks shall be allotted for internal evaluation and 75 marks for the end semester examination (viva voce). The end semester examination of the UG major project shall be conducted by the same committee as appointed for the UG mini-project. In addition, the UG major project supervisor shall also be included in the committee. The topics for UG mini project, seminar and UG major project shall be different from one another. The evaluation of U G major project shall be made at the end of IV year II semester. The internal evaluation shall be on the basis of two seminars given by each student on the topic of UG major project.

8.8 The laboratory records and internal test papers shall be preserved in the institution for two Semesters.

8.9 For mandatory courses viz. environmental studies, professional ethics and gender sensitization lab, a student has to secure 40 marks out of 100 marks (i.e. 40% of the marks allotted) in the continuous internal evaluation for passing the subject/course.

8.10 For mandatory courses NCC/ NSO and NSS, a '**satisfactory participation certificate'** shall be issued to the student from the authorities concerned, only after securing ≥ 65% attendance in such a course.

8.11 No marks or letter grade shall be allotted for all mandatory/non-credit courses.

9.0 Grading procedure

9.1 Marks will be awarded to indicate the performance of student in each theory subject, laboratory / practical's, seminar, UG mini project and UG major project. Based on the percentage of marks obtained (Continuous Internal Evaluation plus Semester End Examination, both taken together) as specified in item 8 above, a corresponding letter grade shall be given.

9.2 As a measure of the performance of student, a 10-point absolute grading system using the following letter grades (as per UGC/AICTE guidelines) and corresponding percentage of marks shall be followed:

% of Marks Secured in a Subject/Course (Class Intervals)	Letter Grade (UGC Guidelines)	Grade Points
Greater than or equal to 90%	O (Outstanding)	10
80 and less than 90%	A^+ (Excellent)	9
70 and less than 80%	A (Very Good)	8
60 and less than 70%	B^+ (Good)	7
50 and less than 60%	B (Average)	6
40 and less than 50%	C (Pass)	5
Below 40%	F (FAIL)	0
Absent	Ab	0

9.3 A student obtaining '**F'** grade in any subject shall be deemed to have '**failed'** and is required to reappear as a 'supplementary student' in the semester end examination, as and when offered. In such cases, internal marks in those subjects will remain the same as those obtained earlier.

9.4 A student who has not appeared for examination in any subject, '**Ab'** grade will be allocated in that subject, and student shall be considered '**failed'**. Student will be required to reappear as a 'supplementary student' in the semester end examination, as and when offered.

9.5 A letter grade does not indicate any specific percentage of marks secured by the student, but it indicates only the range of percentage of marks.

9.6 A student earns grade point (GP) in each subject/ course, on the basis of the letter grade secured in that subject/ course. The corresponding 'credit points' (CP) are computed by multiplying the grade point with credits for that particular subject/ course.

Credit points (C P) = grade point (GP) x credits …. For a course

9.7 The student passes the subject/ course only when **GP $\geq$ 5 ('C' grade or above)**

9.8 The semester grade point average (SGPA) is calculated by dividing the sum of credit points ($\sum$CP) secured from all subjects/courses registered in a semester, by the total numbers of credits registered during that semester. SGPA is rounded off to **two** decimal

places. SGPA is thus computed as

SGPA = $\{\sum_{i=1}^{N} C_i G_i\}$ **/** $\{\sum_{i=1}^{N} C_i\}$ **. . . . . For each semester.**

Where 'i' is the subject indicator index (takes into account all subjects in a semester), 'N' is the no. of subjects **'registered'** for the semester (as specifically required and listed under the course structure of the parent department). $\mathbf{G_i}$ is the no. of credits allotted to the i^{th} subject, and $\mathbf{G_i}$ represents the grade points (GP) corresponding to the letter grade awarded for that i^{th} subject.

9.9 The cumulative grade point average (CGPA) is a measure of the overall cumulative performance4 of a student in all semesters considered for registration. The CGPA is the ratio of the total credit points secured by a student in all registered courses in all semesters, and the total number of credits registered in all the semesters. CGPA is rounded off to two decimal places. CGPA is thus computed from the I year II semester onwards at the end of each semester as per the formula

CGPA = $\{\sum_{j=1}^{M} C_j G_j\}$ **/** $\{\sum_{j=1}^{N} C_j\}$ **. . . . . For all S semester registered (i.e., up to and inclusive of S semester, S** $\geq$ **2),**

Where '**M'** is the total no. of subjects (as specifically required and listed under the course structure of the parent department) the student has **'registered'** i.e., from the 1^{st} semester onwards up to and inclusive of the 8^{th} semester, **'j'** is the subject indicator index (takes into account all subjects for 1 to 8 semesters), C_j is the no. of credits allotted to the j^{th} subject, and G_j represents the grade points (GP) corresponding to the letter grade awarded for the j^{th}subject. After registration and completion of first year first semester, the SGPA of that semester itself may be taken as the CGPA, as there are no cumulative effects.

Illustration of calculation of SGPA

Course/Subject	Credits	Letter Grade	Grade Points	Credit Points
Course 1	4	A	8	4 x 8 = 32
Course 2	4	O	10	4 x 10 = 40
Course 3	4	C	5	4 x 5 = 20
Course 4	3	B	6	3 x 6 = 18
Course 5	3	A+	9	3 x 9 = 27
Course 6	3	C	5	3 x 5 = 15
	21			152

SGPA = 152/21 = 7.24

Illustration of calculation of SGPA:

Course/Subject	Credits	Letter Grade	Grade Points	Credit Points
I Year I Semester				
Course 1	4	A	8	4 x 8 = 32
Course 2	4	A+	9	4 x 9 = 36
Course 3	4	B	6	4 x 6 = 24
Course 4	3	O	10	3 x 10 = 30
Course 5	3	B+	7	3 x 7 = 21
Course 6	3	A	8	3 x 8 = 24
I Year II Semester				
Course 7	4	B+	7	4 x 7 = 28
Course 8	4	O	10	4 x 10 = 40
Course 9	4	A	8	4 x 8 = 32
Course 10	3	B	16	3 x 6 = 18
Course 11	3	C	5	3 x 5 = 15
Course 12	3	A+	9	3 x 9 = 27
Total Credits =	42		Total Credit Points=	327

CGPA = 327/42 = 7.79

9.10 For merit ranking or comparison purposes or any other listing, **only** the '**rounded off'** values of the CGPAs will be used.

9.11 For calculations listed in regulations 9.6 to 9.9, performance in failed subjects/ courses (securing **F** grade) will also be taken into account, and the credits of such subjects/ courses will also be included in the multiplications and summations. After passing the failed subject(s) newly secured letter grades will be taken into account for calculation of SGPA and CGPA. However, mandatory courses will not be taken into consideration.

10.0 Passing standards

10.1 A student shall be declared successful or 'passed' in a semester, if student secures a GP ≥ 5 ('C' grade or above) in every subject/course in that semester (i.e. when student gets an SGPA ≥ 5.00 at the end of that particular semester); and a student s hall be declared successful or 'passed' in the entire under graduate programme, only when gets a CGPA ≥ 5.00 for the award of the degree as required.

10.2 After the completion of each semester, a grade card or grade sheet (or transcript) shall be issued to all the registered students of that semester, indicating the letter grades and credits earned. It will show the details of the courses registered (course code, title, no. of credits, and grade earned etc.), credits earned, SGPA, and CGPA.

11.0 Declaration of results

11.1 Computation of SGPA and CGPA are done using the procedure listed in 9.6 to 9.9.

11.2 For final percentage of marks equivalent to the computed final CGPA, the following formula may be used.

% of Marks = (final CGPA – 0.5) x 10

12.0 Award of degree

12.1 A student who registers for all the specified subjects/ courses as listed in the course structure and secures the required number of 192 credits (with CGPA ≥ 5.0), within 8 academic years from the date of commencement of the first academic year, shall be declared to have '**qualified'** for the award of the B.Tech. degree in the chosen branch of Engineering as selected at the time of admission.

12.2 A student who qualifies for the award of the degree as listed in item 12.1 shall be placed in the following classes.

12.3 Students with final CGP A (at the end of the under graduate programme) ≥ 8.00, and fulfilling the following conditions -

(i) Should have passed all the subjects/courses in '**first appearance'** within the first 4 academic years (or 8 sequential semesters) from the date of commencement of first year first semester.

(ii) Should have secured a CGPA ≥ 8.00, at the end of each of the 8 sequential semesters, starting from first year first semester onwards.

(iii) Should not have been detained or prevented from writing the end semester examinations in any semester due to shortage of attendance or any other reason, shall be placed in '**first class with distinction'**.

12.4 Students with final CGP A (at the end of the under graduate program me) ≥ 6.50 but < 8.00, shall be placed in '**first class'**.

12.5 Students with final CGP A (at the end of the under graduate program me) ≥ 5.50 but < 6.50, shall be placed in '**second class'**.

12.6 All other students who qualify for the award of the degree (as per item 12.1), with final CGPA (at the end of the under graduate programme) ≥ 5.00 but < 5.50, shall be placed in '**pass class**'.

12.7 A student with final CGP A (at the end of the under graduate programme) < 5.00 will not be eligible for the award of the degree.

12.8 Students fulfilling the conditions listed under item 12.3 alone will be eligible for award of '**First Rank**' and '**Gold Medal**'.

13.0 Withholding of results

13.1 If the student has not paid the fees to the university/college at any stage, or has dues pending due to any reason whatsoever, or if any case of indiscipline is pending, the result of the student may be withheld, and student will not be allowed to go into the next higher semester. The award or issue of the degree may also be withheld in such cases.

14.0 Transitory regulations

14.1 A student who has discontinued for any reason, or has been detained for want of attendance or lack of required credits as specified, or who has failed after having undergone the degree programme, may be considered eligible for re admission to the same subjects/courses (or equivalent subjects/ courses, as the case may be), and same professional electives/open electives (or from set/category of elective s or equivalents suggested, as the case m ay be) as and when they are offered (within the time-frame of 8 years from the date of commencement of student's first year first semester).

15.0 Student transfers

15.1 There shall be no branch transfers after the completion of admission process.

15.2 There shall be no transfers from the college/stream to another college.

16.0 Scope

16.1 The academic regulations should be read as a whole, for the purpose of any interpretation.

16.2 In case of any doubt or ambiguity in the interpretation of the above rules, the decision of the Head of the Institution is final.

16.3 The institution may change or amend the academic regulations, course structure or syllabi at any time if necessary, and the changes or amendments made shall be applicable to all students with effect from the date notified by the JBIET authorities.

J.B. INSTITUTE OF ENGINEERING AND TECHNOLOGY (JBIET)
UGC AUTONOMOUS
Bhaskar Nagar, Moinabad, Hyderabad – 500075, Telangana, India

Academic Regulations for B.Tech. (Lateral Entry Scheme) w.e.f the A Y 2017-18

1. **Eligibility for award of B. Tech. Degree (LES)**

   The LES students after securing admission shall pursue a course of study for not less than three academic year s and not more than six academic years.

2. The student shall register for 144 credits and secure 144 credits with CGPA ≥ 5 from II year to IV year B.Tech. programme (LES) for the award of B.Tech. degree. **Out of the144 credits secured, the student can avail exemption up to 6 credits**, that is, one open elective subject and one professional elective subject or two professional elective subjects resulting in 138 credits for B.Tech programme performance evaluation**.**
3. The students, who fail to fulfil the requirement for the award of the degree in six academic years from the year of admission, shall forfeit their seat in B.Tech.
4. The attendance requirements of B. Tech. (Regular) shall be applicable to B.Tech. (LES).
5. **Promotion Rule:**

S. No	Promotion	Conditions to fulfilled
1	Second year first semester to second year second semester	Regular course of study of second year first semester.
2	Second year second semester to third year first semester	(i) Regular course of study of second year second semester. (ii) Must have secured at least 29 credits out of 48 credits i.e., 60% of credits up to second year second semester from all the relevant regular and supplementary examinations, whether the student takes those examinations or not.
3	Third year first semester to third year second semester	Regular course of study of third year first semester.
4	Third year second semester to fourth year first semester	(i) Regular course of study of third year second semester. (ii) Must have secured at least 58 credits out of 96 credits i.e., 60% of credits up to third year second semester from all the relevant regular and supplementary examinations, whether the student takes those examinations or not.
5	Fourth year first semester to fourth year second semester	Regular course of study of fourth year first semester.

6. **All the other regulations as applicable to B. Tech. 4-year degree course (Regular) will hold good for B. Tech. (Lateral Entry Scheme).**

MALPRACTICES RULES

DISCIPLINARY ACTION FOR / IMPROPER CONDUCT IN EXAMINATIONS

S.No.	**Nature of Malpractice/Improper conduct**	**Punishment**
	If the student:	
1.(a)	Possesses or keeps accessible in examination hall, any paper, note book, programmable calculators, cell phones, pager, palm computers or any other form of material concerned with or related to the subject of the examination (theory or practical) in which student is appearing but has not made use of (material shall include any marks on the body of the subject of the examination)	Expulsion from the examination hall and cancellation of the performance in that subject only.
(b)	Gives assistance or guidance or receives it from any other student orally or by any other body language methods or communicates through cell phones with any student or persons in or outside the exam hall in respect of any matter.	Expulsion from the examination hall and cancellation of the performance in the subject only of all the students involved. In case of an outsider, he will be handed over to the police and a case is registered against him.
2.	Has copied in the examination hall from any paper, book, programmable calculators, palm computers or any other form of material relevant to the subject of the examination (theory or practical) in which the student is appearing.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the student has already appeared including practical examinations and UG major project and shall not be permitted to appear for the remaining examinations of the subjects of that semester/year. The hall ticket of the student is to be cancelled and sent to the university.
3.	Impersonates any other student in connection with the examination.	The student who has impersonated shall be expelled from examination hall. The student is also debarred and forfeits the seat. The performance of the original student, who has been impersonated, shall be cancelled in all the subjects of the examination (including practical's and UG major project) already appeared and shall not be allowed to appear for examinations of the remaining subjects of that semester/year. The student is also debarred for two consecutive

		semesters from class work and all university examinations. The continuation of the course by the student is subject to the academic regulations in connection with forfeiture of sea. If the imposter is and outsider, he will be handed over to the police and a case is registered against him.
4.	Smuggles in the answer book or additional sheet or takes our or arranges to send out the question paper during the examination or answer book or additional sheet, during or after the examination.	Expulsion from the examination hall and cancellation of performance in the subject and all the other subjects the student has already appeared including practical examinations and UG major project and shall not be permitted for the remaining examinations of the subjects of that semester year. The student is also debarred for two consecutive semesters from class work and all university examinations. The continuation of the course by the student is subject to the academic regulations in connection with forfeiture of seat.
5.	Uses objectionable, abusive or offensive language in the answer paper or in letters to the examiners or writes to the examiner requesting him to award pass marks.	Cancellation of the performance in that subject.
6.	Refuses to obey the orders of the chief superintendent/assistant – superintendent / any officer on duty or misbehaves or creates disturbance of any kind in and around the examination hall or organizers a walk out or instigates others to walk out, or threatens the officer-in charge or any person on duty in or outside the examination hall of any injury to his person or to any of his relations whether by words, either spoken or writer or by signs or by spoken or written or by signs or by visible representation, assaults the officer-in-charge, or any person on duty in or outside the examination hall or any of his relations, or indulges in any other act of misconduct or mischief which result in damage to or destruction of property in the examination hall or any part of the college campus or	In case of students of the college, they shall be expelled from examination halls and cancellation of their performance in that subject and all other subjects the student(s) has (have) already appeared and shall not be permitted to appear for the remaining examinations of the subjects of that semester/year. The students also are debarred and forfeit their seats. In case of outsiders, they will be handed over to the police and a police case is registered against them.

	engages in any other act which in the opinion of the officer on duty amounts to use of unfair means or misconduct or has the tendency to disrupt the orderly conduct of the examination.	
7.	Leaves the exam hall taking away answer script or intentionally tears of the script or any thereof inside or outside the examination hall.	Expulsion from the examination hall and cancellation of performance in that subject and all the other subjects the student has already appeared including practical examinations and UG major project and shall not be permitted for the remaining examinations of the subjects of that semester/year. The student is also debarred for two consecutive semesters from class work and all university examinations. The continuation of the course by the student is subject to the academic regulations in connection with forfeiture of seat.
8.	Possess any lethal weapon or firearm in the examination hall.	Expulsion from the examination hall and cancellation of performance in that subject and all other subjects the student has already appeared including practical examinations and UG major project and shall not be permitted for the remaining examinations of the subjects of that semester/year. The student is also debarred and forfeiture of seat.
9.	If student of the college, who is not a student for the particular examination or any person not connected with the college indulges in any malpractice or improper conduct mentioned in clause 6 to 8.	Student of the colleges expulsion from the examination hall and cancellation of the performance in that subject and all the other subjects the student has already appeared including practical examinations and UG major project and shall not be permitted for the remaining examinations of the subjects of that semester/year. The student is also debarred and forfeiture of seat. Person(s) who do not belong to the college will be handed over to police and, a police case will be registered against them.

10.	Comes in a drunken condition to the examination hall.	Expulsion from the examination hall and cancellation of performance in that subject and all other subjects the student has already appeared including practical examinations and UG major project and shall not be permitted for the remaining examinations of the subjects of that semester/year.
11.	Copying detected on the basis of internal evidence, such as, during valuation or during special scrutiny.	Cancellation of performance in that subject and all other subjects the student has appeared including practical examinations and UG major project of that semester/year examinations.
12.	If any malpractice is detected which is not covered in the above clauses 1 to 11 shall be reported to the university for further action to award suitable punishment.	

Malpractices identified by squad or special invigilators will be further investigated through a committee and suitable punishment will be given to the students as mentioned by the University guidelines.

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INFORMATION TECHNOLOGY

COURSE STRUCTURE – R16

I B. Tech – I Semester

S. No.	Code	Subject	L	T-P-D	C
1	E110A	Mathematics – I	3	1-0-0	3
2	E110B	Engineering Chemistry	4	0-0-0	4
3	E110C	Engineering Physics – I	3	1-0-0	3
4	E110D	Professional Communication in English	3	0-0-0	3
5	E113A	Engineering Mechanics	3	1-0-0	3
6	E112A	Basic Electrical and Electronics Engineering	4	0-0-0	4
7	E1101	English Language Communication Skills Lab	0	0-3-0	2
8	E1102	Engineering Workshop	0	0-3-0	2
9	E110F	Environmental Studies	2	0-0-0	0
		Total	**22**	**3-6-0**	**24**

I B.Tech – II Semester

Sl. No.	Code	Subject	L	T-P-D	C
1	E120A	Engineering Physics – II	3	0-0-0	3
2	E120B	Mathematics – II	4	1-0-0	4
3	E120C	Mathematics – III	4	1-0-0	4
4	E125A	Computer Programming in C	3	0-0-0	3
5	E123A	Engineering Drawing	2	0-0-4	4
6	E1201	Engineering Chemistry Lab	0	0-3-0	2
7	E1202	Engineering Physics Lab	0	0-3-0	2
8	E1203	Computer Programming in C Lab	0	0-3-0	2
9	E120E	Professional Ethics	2	0-0-0	0
		Total	**18**	**2-9-4**	**24**

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INFORMATION TECHNOLOGY

COURSE STRUCTURE – R16

II B.Tech – I Semester

S. No.	Code	Subject	L	T-P-D	C
1	E210C	Complex Analysis & Discrete Mathematics	3	1-0-0	3
2	E216A	Mathematical Foundations of Computer Science	3	0-0-0	3
3	E215A	Data Structures Through C	4	0-0-0	4
4	E216B	Digital Logic Design & Computer Organization	4	1-0-0	4
5	E215B	Database Management Systems	4	1-0-0	4
6	E2119	Data Structures Through C Lab	0	0-3-0	2
7	E2120	Database Management Systems Lab	0	0-3-0	2
8	E2121	Basic Electrical and Electronics Lab	0	0-3-0	2
9	E2122	Gender Sensitization	0	0-2-0	0
		Total	**18**	**3-11-0**	**24**

II B.Tech – II Semester

S. No.	Code	Subject	L	T-P-D	C
1	E220A	Managerial Economics and Financial Analysis	3	0-0-0	3
2	E226A	Operating Systems	4	1-0-0	4
3	E226B	Object Oriented Programming Through Java	4	1-0-0	4
4	E225A	Design and Analysis of Algorithms	3	0-0-0	3
5	E225B	Computer Networks	4	1-0-0	4
6	E2218	Operating Systems Lab	0	0-3-0	2
7	E2219	Object Oriented Programming Through Java	0	0-3-0	2
8	E2220	Computer Networks Lab	0	0-3-0	2
		Total	**18**	**3-9-0**	**24**

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COURSE STRUCTURE – R16

III B.Tech – I Semester

S. No.	Code	Subject	L	T-P-D	C
1	E315A	PYTHON Programming	4	1-0-0	4
2	E316A	Object Oriented Software Engineering	4	1-0-0	4
3	E315E	Linux programming	4	1-0-0	4
4	E310B	Management Science	4	0-0-0	3
5		**Open Elective-I**	3	0-0-0	3
6	E3116	PYTHON Programming Lab	0	0-3-0	2
7	E3117	Object Oriented Software Engineering Lab	0	0-3-0	2
8	E3118	Linux Programming Lab	0	0-3-0	2
		Total	**19**	**3-9-0**	**24**

III B.Tech – II Semester

S. No.	Code	Subject	L	T-P-D	C
1	E325F	Web Technologies	4	1-0-0	4
2	E326A	Data Warehousing and Data Mining	4	1-0-0	4
3	**Open Elective-II**		3	0-0-0	3
4	**Professional Elective-I**		4	0-0-0	4
5	**Professional Elective-II**		4	0-0-0	4
6	E3216	Web Technologies Lab	0	0-3-0	2
7	E3217	Data Mining Lab	0	0-3-0	2
8	E3218	Employability Skills	0	0-2-0	1
		Total	**19**	**2-8-0**	**24**

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COURSE STRUCTURE – R16

IV B.Tech – I Semester

S. No.	Code	Subject	L	T-P-D	C
1	E416A	Automata and Compiler Design	4	1-0-0	4
2	E416B	Embedded Systems	4	1-0-0	4
3	**Professional Elective -III**		4	0-0-0	4
4	**Professional Elective -IV**		4	0-0-0	4
5	**Professional Elective -V**		4	0-0-0	4
6	E4112	Embedded Systems Lab	0	0-3-0	2
7	E4113	Industry Oriented Mini Project	0	0-0-0	2
		Total	**20**	**2-3-0**	**24**

IV B.Tech – II Semester

S. No.	Code	Subject	L	T-P-D	C
1	E426A	Mobile Application Development	4	0-0-0	4
2		**Open Elective-III**	3	0-0-0	3
3	E4217	Mobile Application Development Lab	0	0-3-0	2
4	E4216	Seminar	0	0-3-0	1
5	E4218	Major Project	0	0-0-0	14
		Total	**7**	**0-6-0**	**24**

Note: All End Examinations (Theory and Practical) are of three hours duration.

L – Lecture, T – Tutorial, P – Practical, D – Drawing, C – Credits.

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PROFESSIONAL ELECTIVE SUBJECTS R16

Professional Elective – I

S. No.	Code	Subject	L	T-P-D	C
1	E326B	Principles of Programming Language	4	0-0-0	4
2	E326C	Wireless Networks and Mobile Computing	4	0-0-0	4
3	E326D	Adhoc Sensor Networks	4	0-0-0	4

Professional Elective – II

S. No.	Code	Subject	L	T-P-D	C
1	E326E	Software Testing Methodologies	4	0-0-0	4
2	E326F	Information Retrieval Systems	4	0-0-0	4
3	E325E	Cloud Computing	4	0-0-0	4

Professional Elective – III

S. No.	Code	Subject	L	T-P-D	C
1	E416C	Internet of Things	4	0-0-0	4
2	E416D	Distributed Database	4	0-0-0	4
3	E415A	Big Data Analytics	4	0-0-0	4

Professional Elective – IV

S. No.	Code	Subject	L	T-P-D	C
1	E415C	Web Services	4	0-0-0	4
2	E416E	Software Architecture and Design Pattern	4	0-0-0	4
3	E416F	Software Project Management	4	0-0-0	4

Professional Elective – V

Sl No.	Code	Subject	L	T-P-D	C
1	E415G	Information Security	4	0-0-0	4
2	E415F	Cyber Security	4	0-0-0	4
3	E415D	Database Security	4	0-0-0	4

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COURSE STRUCTURE – R16

List of Subjects offered by various Board of Studies

Open Elective – I

S. No.	Code	Name of the Subject	Name of the BOS offering the Subject
1	E31OC	Disaster Management	Civil Engineering
2	E31OD	Elements of Civil Engineering	Civil Engineering
3	E31OE	Network Analysis and Synthesis	Electrical and Electronics Engineering
4	E31OF	Measurements and Instruments	Electrical and Electronics Engineering
5	E31OG	Automobile Engineering	Mechanical Engineering
6	E31OI	Engineering Materials and Fabrication Processes	Mechanical Engineering
7	E31OJ	Principles of Electronic Communications	Electronics and Communication Engineering
8	E31OK	Matlab Programming	Electronics and Communication Engineering
9	E31OL	Data Structures through C	Computer Science and Engineering
10	E31OM	Python Programming	Computer Science and Engineering
11	E31ON	E-Disaster Management	Information Technology
12	E31OO	Human Computer Interaction	Information Technology
13	E31OP	Introduction to Microprocessors and Microcontrollers	Electronics and Computer Engineering
14	E31OQ	Internet of Things	Electronics and Computer Engineering

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COURSE STRUCTURE – R16

List of Subjects offered by various Board of Studies

Open Elective – II

S. No.	Code	Name of the Subject	Name of the BOS offering the Subject
1	E32OA	Estimation, Quantity Survey & Valuation	Civil Engineering
2	E32OB	Waste Management	Civil Engineering
3	E32OC	Non-Conventional Energy Sources and Applications	Electrical and Electronics Engineering
4	E32OD	Electrical Technology	Electrical and Electronics Engineering
5	E32OE	Operation Research	Mechanical Engineering
6	E32OG	Nanotechnology	Mechanical Engineering
7	E32OH	Applications of Micro Processors and Controllers	Electronics and Communication Engineering
8	E32OI	Fundamentals of HDL	Electronics and Communication Engineering
9	E32OJ	Database Management Systems	Computer Science Engineering
10	E32OK	Cloud Computing	Computer Science Engineering
11	E32OL	E-Waste Management	Information Technology
12	E32OM	Introduction to Web Design	Information Technology
13	E32ON	Introduction to Embedded systems	Electronics and Computer Engineering
14	E32OO	Fundamentals of E-Commerce	Electronics and Computer Engineering

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COURSE STRUCTURE – R16

List of Subjects offered by various Board of Studies

Open Elective – III

S. No.	Code	Name of the Subject	Name of the BOS offering the Subject
1	E42OA	Environmental Impact Assessment	Civil Engineering
2	E42OB	Green Building Technology	Civil Engineering
3	E42OC	Materials in Electrical Systems	Electrical and Electronics Engineering
4	E42OD	Field Theory and Circuits	Electrical and Electronics Engineering
5	E42OE	Reliability Engineering	Mechanical Engineering
6	E42OG	Special Manufacturing Processes	Mechanical Engineering
7	E42OH	Principles of Computer Communication and Networks	Electronics and Communication Engineering
8	E42OI	Speech Processing	Electronics and Communication Engineering
9	E42OJ	Soft Computing	Computer Science Engineering
10	E42OK	E-commerce	Computer Science Engineering
11	E42OL	Internet of Things	Information Technology
12	E42OM	Semantic Web and Social Networks	Information Technology
13	E42ON	Fundamentals of Intelligence Systems	Electronics and Computer Engineering
14	E42OO	Introduction to Neural Networks	Electronics and Computer Engineering

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B.Tech.: IT	**L**	**T-P-D**	**C**
I Year - I Semester	**3**	**1-0-0**	**3**

(E110A) MATHEMATICS – I

(Common to CE,EEE,ME,ECE,CSE,IT,ECM & MIE)

Course Objectives :

The student will:

1. Understand the methods of solving the linear differential equations of first and higher order and applications of the differential equations
2. Recognize the types of matrices and their properties and the concept of rank of a matrix and applying the same to understand the consistency
3. Learn how to solve the linear systems and the concepts of eigen values and eigen vectors and reducing the quadratic forms into their canonical forms
4. Equipped with the concept of total derivative and finding maxima and minima of functions of two variables
5. Formation of the partial differential equations and solving the first order equations.

UNIT–I: Initial Value Problems and Applications

Exact differential equations - Reducible to exact.

Linear differential equations of higher order with constant coefficients: Non homogeneous terms with RHS term of the type e^{ax} , sin ax, cos ax, polynomials in x, e^{ax} V(x), xV(x)-Operator form of the differential equation, finding particular integral using inverse operator, Wronskian of functions, method of variation of parameters.

Applications: Newton's law of cooling, law of natural growth and decay, orthogonal trajectories, Electrical circuits.

UNIT–II: Linear Systems of Equations

Types of real matrices and complex matrices, rank, echelon form, normal form, consistency and solution of linear systems (homogeneous and Non-homogeneous) - Gauss elimination, Gauss Jordon and LU decomposition methods- Applications: Finding current in the electrical circuits.

UNIT–III: Eigen values, Eigen Vectors and Quadratic Forms

Eigen values, Eigen vectors and their properties, Cayley - Hamilton theorem (without proof), Inverse and powers of a matrix using Cayley - Hamilton theorem, Diagonalization, Quadratic forms, Reduction of Quadratic forms into their canonical form, rank and nature of the Quadratic forms – Index and signature.

UNIT–IV: Partial Differentiation

Introduction of partial differentiation, homogeneous function, Euler's theorem, total derivative, Chain rule, Taylor's and Mclaurin's series expansion of functions of two variables, functional dependence, Jacobian.

Applications: maxima and minima of functions of two variables without constraints and Lagrange's method (with constraints)

UNIT-V:

First Order Partial Differential Equations

Formation of partial differential equations by elimination of arbitrary constants and arbitrary functions, Lagranges method to solve the first order linear equations and the standard type methods to solve the non linear equations.

TEXT BOOKS:

1. Higher Engineering Mathematics by Dr. B. S. Grewal, Khanna Publishers.
2. A first course in differential equations with modeling applications by Dennis G. Zill, Cengage Learning publishers

REFERENCES:

1. Advanced Engineering Mathematics by E. Kreyszig, John Wiley and Sons Publisher.
2. Engineering Mathematics by N. P. Bali, Lakshmi Publications.

Course Outcomes:

The student will be able to:

1. Solve higher order DE's and apply them for solving some real world problems.
2. Write the matrix representation of a set of linear equations and to analyze the solution of the system of equations.
3. Analyze the Eigen values and Eigen vectors which come across under linear transformations.
4. Examine the values of functions of two variables with/ without constraints.
5. Solve linear partial differential equations of first order.

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B.Tech. IT	**L**	**T-P-D**	**C**
I Year - I Semester	**4**	**0-0-0**	**4**

(E110B) ENGINEERING CHEMISTRY

(Common to EEE, ECE, CSE,IT & ECM)

Course Objectives:

The Student will:

1. Acquire the skills to critically assess and solve problems related to water requiring the application of chemical principles.
2. Familiar with research design methodology and to use problem-solving techniques associated with electrochemistry.
3. Recognize, organize and present chemical information coherently through oral and written discourse based on polymers.
4. Apply science and engineering in the analysis and evaluation of process involved in production of energy efficient fuels.
5. Invent or discover new environmental friendly, energy efficient and economically effective engineering materials in a sustainable manner.

UNIT-I: Water and its treatment

Introduction – hardness of water – causes of hardness – types of hardness: temporary and permanent – expression and units of hardness – Estimation of hardness of water by complex metric method. Numerical problems. Potable water and its specifications- Steps involved in the treatment of potable water - Disinfection of potable water by chlorination and Ozonization. Defluoridation – Nalgonda technique - Determination of F^- ion by ion-selective electrode method.

Boiler troubles: Sludges, scales and Caustic embrittlement. Internal treatment of Boiler feed water (Calgon conditioning – Phosphate conditioning - Colloidal conditioning) .Softening of water by ion-exchange processes. Desalination of water – Electro dialysis& Reverse osmosis. Numerical problems.

UNIT-II: Electrochemistry and Batteries

Electrochemistry: Electrode- electrode potential, standard electrode potential, types of electrodes – Construction and functioning of Standard hydrogen electrode, calomel, Quinhydrone and glass electrode. Nernst equation - electrochemical series and its applications. Electrochemical cells: Daniel cell – cell notation, cell reaction and cell emf – Potentiometric titrations and Applications- Determination of pH and EMF. Concept of concentration cells-electrolyte concentration cell. Numerical problems.

Batteries: Cell and battery - Primary battery (dry cell, alkaline cell and Lithium cell) and Secondary battery (lead acid, Ni-Cd and lithium ion cell), **Fuel cells:** Hydrogen –oxygen, phosphoric acid and methanol-oxygen fuel cells – Applications.

UNIT-IV: Fuels and Combustion

Classification- solid fuels: coal – analysis of coal – proximate and ultimate analysis and their significance. Liquid fuels – petroleum and its refining, cracking – types – moving bed catalytic cracking. Knocking – octane and cetane rating, synthetic petrol - Fischer-Tropsch's process; Gaseous fuels – composition and uses of natural gas, LPG and CNG.

Combustion: Definition, Calorific value of fuel – HCV, LCV-Dulongs Formula; Calculation of air quantity required for combustion of a fuel.

UNIT-V: Engineering Materials and applications

Lubricants-Classification of lubricants with examples-characteristics of a good lubricants – mechanism of lubrication-properties of lubricants.

Conducting polymers: Characteristics and Classification with examples-mechanism of conduction in trans-polyacetylene and applications of conducting polymers.

Nanomaterials: Introduction, Preparation-Top down & bottom up process-sol gel method and self assembly process. Applications of nonmaterial's.

Composites: Introduction- Constituents of composites – advantages, classification and constituents of composites. Fiber reinforced plastics (FRP). Applications of composites.

TEXT BOOKS:

1. Engineering Chemistry by P.C. Jain and M. Jain, Dhanpatrai Publishing Company, New Delhi
2. Engineering Chemistry by Rama Devi, VenkataRamana Reddy and Rath, Cengage learning, New Delhi
3. Engineering Chemistry by Shashi Chawla, Dhanpatrai and Company (P) Ltd. Delhi

REFERENCES:

1. Engineering Chemistry by Shikha Agarwal, Cambridge University Press, Delhi
2. Engineering Chemistry by Thirumala Chary and Laxminarayana, Scitech Publishers, Chennai
3. Engineering Chemistry by Andhra Naidu. B.S Publications.
4. Chemistry of Engineering Materials by CV Agarwal,C.P Murthy, A.Naidu, BS Publications.

Course Outcomes:

The student will be able to:

1. Asses and solve problems requiring the application of chemical principles.
2. Use problem solving techniques associated with research design methodology.
3. Present chemical information through oral and written discourse and evaluate engineering components and systems based on polymers.
4. Produce new innovative methods and engineering materials that are useful in every walk of life.
5. Develop and apply new chemical techniques for the production of engineering materials that are useful in every walk of life.

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UGC AUTONOMOUS

B.Tech. IT	**L**	**T-P-D**	**C**
I Year - I Semester	**3**	**1-0-0**	**3**

(E110C) ENGINEERING PHYSICS-I

(Common to EEE, ECE, CSE,IT & ECM)

Course Objectives:

The Student will:

1. Understand interaction of light with matter through interference, diffraction and polarization.
2. Distinguish between ordinary light with a laser light and to realize propagation of light through optical fibers.
3. Analyze various crystal systems and there structures elaborately.
4. Analyze various crystal imperfections and probing methods like X-RD.
5. Understand concepts of latest developments in fiber optics.

UNIT-I : Crystallography

Space lattice, unit cell and lattice parameters, crystal systems, Bravaislattices, atomic radius, co-ordination number and packing factor of SC, BCC, FCC, HCP and diamond, Miller indices, crystal planes and directions, inter planar spacing of orthogonal crystal systems.

UNIT-II : X-ray Diffraction and Defects in Crystals

Bragg's law, X-ray diffraction methods: Laue method, powder method; point defects: vacancies, substitutional, interstitial, Frenkel and Schottky defects, line defects (qualitative) and Burger's vector, surface defects: stacking faults, twin, tilt and grain boundaries.

UNIT-III: Fiber Optics

Principle of optical fiber, construction of fiber, acceptance angle and acceptance cone, numerical aperture, types of optical fibers: step index and graded index fibers, attenuation in optical fibers, applications of optical fibers in medicine and sensors**.**

UNIT-IV: Interference

Coherence, division of amplitude and division of wave front, interference in thin films (transmitted and reflected light), Newton's rings experiment.

Diffraction: Distinction between Fresnel and Fraunhoffer diffraction, diffraction due to single slit, N-slits, Diffraction grating experiment.

UNIT-V: Polarization

Introduction, Malus's law, doubles refraction, Nicol prism, Quarter wave and half wave plates.

Lasers: Characteristics of lasers, spontaneous and stimulated emission of radiation, Einstein coefficients, population inversion, ruby laser, helium – neon laser, semi conductor laser, applications of lasers.

TEXT BOOKS:

1. Applied Physics – P.K.Mittal (I.K.Internationalhosesepvt Ltd) (New Edition)
2. Enginnering Physics-P.K Palaniswamy (Scitech Publications India) Pvt Ltd, Fifth Print 2010.)
3. Engineering Physics-Senthilkumar ((VRB Publishers Limited,)

REFERENCES:

1. Applied Physics for Engineers – A.J. Dekker (Macmillan).
2. Elements of Material Science – V.Raghavant (PHI Publications).
3. Solid State Physics – M. Armugam (Anuradha Publications).
4. A Text Book of Engg Physics – M. N. Avadhanulu& P. G. Khsirsagar– S. Chand & Co.
5. Modern Physics by K. Vijaya Kumar, S. Chandralingam: S. Chand &Co.Ltd

Course outcomes:

The student will be able to:

1. Distinguish between various crystal systems
2. Identify the crystal defects by using X-RD
3. Get familiarized with the latest developments and applications like Fiber optics
4. Realize the importance of light phenomena in thin films and resolution.
5. Know principle, working of various laser systems and light propagation through optical fibers.

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B.Tech. IT	**L**	**T-P-D**	**C**
I Year - I Semester	**3**	**0-0-0**	**3**

(E110D) PROFESSIONAL COMMUNICATION IN ENGLISH

(Common to CSE,ECE,EEE,IT & ECM)

INTRODUCTION

In view of the growing importance of English as a tool for global communication and the consequent emphasis on training students to acquire language skills, the syllabus of English has been designed to develop linguistic and communicative competencies of Engineering students.

In English classes, the focus should be on the skills development in the areas of vocabulary, grammar, reading and writing. For this, the teachers should use the prescribed text book for detailed study. The students should be encouraged to read the texts/poems silently leading to reading comprehension. Reading comprehension passages are given for practice in the class. The time should be utilized for working out the exercises given after each excerpt, and also for supplementing the exercises with authentic materials of a similar kind, for example, from newspaper articles, advertisements, promotional material, etc. The focus in this syllabus is on skill development, fostering ideas and practice of language skills.

Course Objectives:

The student will:

1. Apply a better use of the English language.
2. Build knowledge in LSRW skills.
3. Paraphrase to be proficient in the use of the language.
4. Design to utilize the acquired skills in their professional as well as day –to –life.
5. Infer their language to understand the core subjects well.

Reading Skills:

Objectives:

- To develop an awareness in students about the significance of silent reading and comprehension.
- To develop students' ability to guess meanings of words from the context and grasp the overall message of the text, draw inferences, etc., by way of:
- Skimming and Scanning the text
- Intensive and Extensive Reading
- Reading for Pleasure
- Identifying the topic sentence

NOTE: The students will be trained in reading skills using the prescribed texts for detailed study. They will be tested in reading comprehension of different 'unseen' passages
Which may be taken from authentic texts, such as magazines/newspaper articles

Writing Skills:

Objectives:

- To develop an awareness in the students about writing as an exact and formal skill
- To create an awareness in students about the components of different forms of writing, beginning with the lower order ones through;
- Writing of sentences
- Use of appropriate vocabulary
- Paragraph writing
- Coherence and cohesiveness
- Narration / description
- Note Making
- Formal and informal letter writing
- Describing graphs using expressions of comparison

In order to improve the proficiency of the students in the acquisition of language skills mentioned above, the following text and course contents, divided into Five Units, are prescribed:

UNIT –I:

Chapter entitled '**Presidential Address' by Dr. A.P.J. Kalam** from ***"Fluency in English–A Course book for Engineering Students" published*** by Orient Black Swan, Hyderabad.

Vocabulary: Word Formation -- Root Words --The Use of Prefixes and Suffixes–Collocations– Exercises for Practice.

Grammar: Punctuation – Parts of Speech- Articles -Exercises for Practice.

Reading: ***Double Angels*** by David Scott-Reading and Its Importance- Techniques for Effective Reading- Signal Words- Exercises for Practice

Writing: Writing Sentences- Techniques for Effective Writing-- Paragraph Writing-Types, Structure and Features of a Paragraph-Coherence and Cohesiveness: Logical, Lexical and Grammatical Devices - Exercises for Practice

UNIT –II:

Chapter entitled ***Satya Nadella: Email to Employees on his First Day as CEO*** from ***"Fluencyin English– A Course book for Engineering Students"*** Published by Orient Black Swan,
Hyderabad.

Vocabulary: Synonyms and Antonyms–Homonyms, Homophones, Homographs- Exercises for Practice (Chapter 17 ***'Technical Communication-Principles and Practice'. Third Edition*** published by Oxford University Press may also be followed.)**Grammar:** Verbs-Transitive, Intransitive and Non-finite Verbs–Mood and Tense— Gerund – Words with Appropriate Prepositions – Phrasal Verbs - Exercises for Practice

Reading: Sub-skills of Reading- Skimming, Scanning, Extensive Reading and Intensive Reading - ***The Road Not Taken*** by **Robert Frost** -- Exercises for Practice

Writing: Letter Writing–Format, Styles, Parts, Language to be used in Formal Letters-Letter of Apology – Letter of Complaint-Letter of Inquiry with Reply – Letter of Requisition –- Exercises for Practice

UNIT –III:

From the book entitled *'**Technical Communication-Principles and Practice'. Third Edition*** published by Oxford University Press.

Vocabulary: Introduction- A Brief History of Words–Using the Dictionary and Thesaurus– Changing Words from One Form to Another – Confusables (From Chapter 17 entitled '*Grammar and Vocabulary Development*')

Grammar: Tenses: Present Tense- Past Tense- Future Tense- Active Voice – Passive Voice- Conditional Sentences – Adjective and Degrees of Comparison. (From Chapter 17 entitled '*Grammar and Vocabulary Development*')

Reading: Improving Comprehension Skills – Techniques for Good Comprehension- Skimming and Scanning- Non-verbal Signals – Structure of the Text – Structure of Paragraphs – Punctuation – Author's viewpoint (Inference) – Reader

Anticipation: Determining the Meaning of Words – Summarizing- Typical Reading Comprehension Questions. (From Chapter 10 entitled '*Reading Comprehension*')

Writing: Introduction- Letter Writing-Writing the Cover Letter- Cover Letters Accompanying Resumes- Emails. (From Chapter 15 entitled '*Formal Letters, Memos, and Email*')

UNIT –IV:

Chapter entitled ***'Good Manners' by J.C. Hill*** from ***Fluency in English–A Course book for Engineering Students"*** published by Orient Blackswan, Hyderabad.

Vocabulary: Idiomatic Expressions–One- word Substitutes --- Exercises for Practice(Chapter 17 ***'Technical Communication-Principles and Practice'. Third Edition*** published by Oxford University Press may also be followed.)**Grammar:** Sequence of Tenses- Concord (Subject in Agreement with the Verb)– Exercises for Practice

Reading: ***'If'*** poem by **Rudyard Kipling**--Tips for Writing a Review ---Author's Viewpoint – Reader's Anticipation-- Herein the Students will be required to Read and Submit a Review of a Book (Literary or Non-literary) of their choice – Exercises for Practice.

Writing: Information Transfer-Bar Charts-Flow Charts-Tree Diagrams etc., -- Exercises for Practice.

Introduction - Steps to Effective Precis Writing – Guidelines- Samples (Chapter 12 entitled '*The Art of Condensation*' from ***Technical Communication-Principles and Practice. Third Edition*** published by Oxford University Press)

UNIT –V:

Chapter entitled ***'Father Dear Father '*by Raj Kinger** from ***Fluency in English–A Course book for Engineering Students"*** Published by Orient Black Swan, Hyderabad

Vocabulary: Foreign Words—Words borrowed from other Languages- Exercises for Practice

Grammar: Direct and Indirect Speech- Question Tags- Exercises for Practice

Reading: Predicting the Content- Understanding the Gist – SQ3R Reading Technique-

Study Skills – Note Making - Understanding Discourse Coherence – Sequencing Sentences. (From Chapter 10 entitled **'Reading Comprehension'-** ***Technical Communication- Principles and Practice. Third Edition*** published by Oxford University Press.)

Writing: Technical Reports- Introduction – Characteristics of a Report – Categories of Reports –Formats- Prewriting – Structure of Reports (Manuscript Format) - Types of Reports - Writing the Report. (From Chapter 13 entitled **'Technical Reports' -** ***Technical Communication- Principles and Practice. Third Edition*** published by Oxford University Press.)

TEXT BOOKS :

1. *"Fluency in English – A Course book for Engineering Students"* by Board of Editors: Hyderabad: Orient Black Swan Pvt. Ltd. 2016. Print.
2. Raman, Meenakshi and Sharma, Sangeeta*. "Technical Communication- Principles and Practice".* Third Edition. New Delhi: Oxford University Press. 2015. Print.

REFERENCES :

1. Green, David. *Contemporary English Grammar–Structures and Composition.* MacMillan India. 2014 (Print)
2. Rizvi, M. Ashraf. *Effective Technical Communication*. Tata Mc Graw –Hill. 2015 (Print).

Course Outcomes:

The student will be able to:

1. Use English language in an effective way.
2. Communicate fluently using LSRW skills.
3. Utilize the language proficiently.
4. Define the challenges competitively in professional as well as day to day life.
5. Analyze the core subjects well through the English language.

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B.Tech. IT	**L**	**T-P-D**	**C**
I Year - I Semester	**3**	**1-0-0**	**3**

(E113A) ENGINEERING MECHANICS

(Common to CE,EEE,ME,ECE,CSE,IT,ECM&MIE)

Course objectives:

The student will :

1. Read the concept of system of forces and its applications.
2. Determine the centroid and centre of gravity of different structures.
3. Understand the concept of inertia and its real time applications.
4. Analyze the bodies in motion.
5. Analyze the bodies in motion by considering the force cause the motion.

UNIT–I: Introduction to Engineering Mechanics

Basic Concepts. Systems of Forces: Coplanar Concurrent Forces–Forces in Space–Moment of Force and its Application–Couples and Resultant of Force Systems.

Equilibrium of Force Systems: Free Body Diagrams, Equations of Equilibrium - Equilibrium of planar Systems -Equilibrium of Spatial Systems.

UNIT–II: Centroid : Centroids of simple figures (from basic principles)–Centroids of Composite Figures

Centre of Gravity: Centre of gravity of simple body (from basic principles), centre of gravity of composite bodies, Pappus theorem.

UNIT–III: Area moment of Inertia

Definition–Polar Moment of Inertia, Transfer Theorem, Moments of Inertia of Composite Figures, Products of Inertia, Transfer Formula for Product of Inertia.

UNIT–IV: Kinematics

Rectilinear and Curvilinear motions–Velocity and Acceleration–Motion of Rigid Body Types and their Analysis in Planar Motion.

UNIT–V: **Kinetics:** Analysis as a Particle and Analysis as a Rigid Body in Translation–Central Force Motion Equations of Plane Motion–Fixed Axis Rotation–Rolling Bodies.

TEXT BOOKS:

1. Engineering Mechanics / Timoshenko & Young.
2. Engineering Mechanics, Basudev Bhattacharya, Oxford Univ. Press, New Delhi, Second Edition, 2014.
3. Engineering Mechanics / Fedinand . L. Singer / Harper–Collins

REFERENCES:

1. Engineering Mechanics / S.S. Bhavikatti& J.G. Rajasekharappa
2. Engineering Mechanics / Irving. H. Shames Prentice–Hall.
3. Engineering Mechanics Umesh Regl / Tayal.
4. Engineering Mechanics-Basic Concepts, Y.V.D.Rao, M.Manzoor Hussain, K.Govinda Rajulu, Academic Publishing Company

Course outcomes:

The student will be able to:

1. Solve the resultant of a force system acting on an object.
2. Evaluate the surface area of complex objects.
3. Acquire the knowledge on various application of moment of inertia.
4. Discuss the kinematics involved in a moving object.
5. Discus the kinetics involved in a moving objects.

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B.Tech. IT	**L**	**T-P-D**	**C**
I Year - I Semester	**4**	**0-0-0**	**4**

(E112A) BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

(Common to CSE,ECE,EEE,IT & ECM)

Course Objectives:

The student will

1. Describe Electric Circuits.
2. Acquire knowledge the given circuit with various theorems and methods.
3. Learn in recognizing of basic electronic devices such as Diodes, Transistors, to build circuits like amplifiers and oscillators etc.
4. Acquire knowledge on the various parameters useful for designing electronic system.
5. Acquire the knowledge of various configurations, characteristics and applications.

UNIT – I: Electrical circuits

R-L-C Parameters, voltage and current, Independent and Dependent Sources, Source Transformation-V-I relationship for passive elements, Kirchhoff's Laws, Network reduction techniques-series, parallel, series-parallel, star-to-delta, delta-to-star transformation, Nodal Analysis .

Single Phase AC Circuits : R.M.S. and Average values, Form Factor, steady state analysis of series, parallel and series-parallel combinations of R, L and C with sinusoidal excitation, concept of reactance, impedance, susceptance and admittance –phase and phase difference, concept of power factor, phasor notation, complex and polar forms of representation.

UNIT-II: Resonance

Series and parallel resonance circuits, concept of bandwidth and Q factor, Locus Diagrams for RL, RC and RLC Combinations for various parameters.

Network Theorems: Thevenin's, Norton's, Maximum power Transfer, Superposition, Reciprocity, Tellegen's, Milliman's and Compensation theorems for DC and AC excitations.

UNIT-III: P-N Junction Diode

P-N junction as a Diode, Symbol, Diode equation, volt-Ampere characteristics, Temperature dependence, Ideal versus practical Diode, static and dynamic resistances, Diffusion and Transition Capacitances.

Rectifiers and Filters: Diode rectifier, Half wave Rectifier, Ripple Factor-Full Wave Rectifier, Bridge Rectifier, Rectifiers with Filters: Inductive Filters, Capacitive Filters, L-section Filters, π-section Filters.

UNIT-IV: Bipolar Junction Transistor (BJT)

Symbol, Construction, principle of Operation, Current Components in a junction transistor Common Emitter, Common Base and Common Collector configurations.

Transistor Biasing -Operating point, DC and AC load lines, Fixed Bias, Collector to Base bias, Self Bias (Voltage divider bias), Bias stability, Stabilization against variations in V_{BE} , β, and $I_{CO.}$

Small signal Transistor Analysis, h- Parameters, Definitions, Determination of h-parameters from CE transistor characteristics, Analysis of CE, CB and CC configurations using h-parameters and their Comparison.

UNIT-V: Junction Field Effect Transistor

Construction, Principle of Operation, pinch-off voltage, Volt-Ampere characteristics, comparison of BJT and JFET, small signal Model, MOSFET: Depletion and Enhancement FETs-construction characteristics.

Special Purpose Devices: Breakdown Mechanisms in semi-Conductor Diodes, Zener diode characteristics, Zener diode as a simple regulator, principle of operation and Characteristics of Tunnel Diode (with help of Energy band diagram) Varactor Diode, Principle of operation of SCR.

TEXT BOOKS:

1. Millman's Electronic Devices and circuits –J.Millman and C.Halkias, Mc Graw Hill
2. Micro Electronics by David bell
3. Network Theory by Sudhakar, Shyam Mohan Palli, TMH.

REFERENCES:

1. Network Theory by N.C.Jagan and C.Lakshminarayana, B.S.Publications.
2. Electronic Devices and Circuits- R.L.Boylestad and Louis Nashelsky, PEI/PHI, 9th Ed, 2006.
3. Engineering circuit analysis-by William Hayt and Jack E.Kemmerly, Mc Graw Hill Company, 6th edition.
4. Linear circuit analysis (time domain phasor and Laplace transform approaches)-2nd edition by Raymond A.DeCarlo and Pen-Min-Lin, Oxford University Press-2004.

Course Outcomes:

The student will be able to:

1. Demonstrate strong fundamental back ground in Electrical Engineering.
2. Analyze and solve problems of ac and dc circuits.
3. Identify the value of different resistors.
4. Analyze and design various electronic circuits through various numerous
5. Design examples using currently-available devices and standard-value components.

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B.Tech. IT	**L**	**T-P-D**	**C**
I Year - I Semester	**0**	**0-3-0**	**2**

(E1101) ENGLISH LANGUAGE COMMUNICATION SKILLS (ELCS) LAB

(Common to EEE,ECE,CSE,IT&ECM)

The **English Language Communication Skills (ELCS) Lab** focuses on the production and practice of sounds of language and familiarizes the students with the use of English in everyday situations both in formal and informal contexts.

Course Objectives:

The student will:

1. Acquire the phonetics of English language for correct pronunciation.
2. Manage the nuances of public speaking.
3. Defined the influence of Mother Tongue.
4. Differentiate the British and the US pronunciation.
5. Develop the right Body Language to support their verbal communication.

Syllabus: English Language Communication Skills Lab (ELCS) shall have two parts:

- **Computer Assisted Language Learning (CALL) Lab**
- **Interactive Communication Skills (ICS) Lab**

Listening Skills:

Objectives

- To enable students develop their listening skills so that they may appreciate the role in the LSRW skills approach to language and improve their pronunciation
- To equip students with necessary training in listening, so that they can comprehend the speech of people of different backgrounds and regions.

Students should be given practice in listening to the sounds of the language, to be able to recognize them and find the distinction between different sounds, to be able to mark stress and recognize and use the right intonation in sentences.

- Listening for general content
- Listening to fill up information
- Intensive listening
- Listening for specific information

Speaking Skills:

Objectives

- To involve students in speaking activities in various contexts
- To enable students express themselves fluently and appropriately in social and professional contexts :
  - Oral practice
  - Describing objects/situations/people
  - Role play – Individual/Group activities
  - Just A Minute (JAM) Sessions.

The following course content is prescribed for the **English Language Communication Skill**

slab.

Exercise – I

CALL Lab:

Understand: Listening Skill- Its importance–Purpose- Process- Types- Barriers- Effective Listening.

Practice: Introduction to Phonetics–Speech Sounds–Vowels and Consonants–Minimal Pairs- Consonant Clusters- Past Tense Marker and Plural Marker.

Testing Exercises

ICS Lab:

Understand: Spoken vs. Written language- Formal and Informal English.

Practice: Ice-Breaking Activity and JAM Session- Situational Dialogues–Greetings–Taking Leave – Introducing Oneself and Others.

Exercise – II

CALL Lab:

Understand: Structure of Syllables–Word Stress–Weak Forms and Strong Forms–Sentence Stress – Intonation.

Practice: Basic Rules of Word Accent - Stress Shift - Weak Forms and Strong Forms- Sentence Stress – Intonation.

Testing Exercises

ICS Lab:

Understand: Features of Good Conversation–Strategies for Effective Communication.

Practice: Situational Dialogues–Role-Play- Expressions in Various Situations–Making Requests and Seeking Permissions - Telephone Etiquette.

Exercise – III

CALL Lab:

Understand: Errors in Pronunciation-the Influence of Mother Tongue (MTI).

Practice: Common Indian Variants in Pronunciation – Differences between British and American Pronunciation.
Testing Exercises

ICS Lab:

Understand: Descriptions- Narrations- Giving Directions and Guidelines.

Practice: Giving Instructions–Seeking Clarifications–Asking for and Giving Directions–Thanking and Responding – Agreeing and Disagreeing – Seeking and Giving Advice – Making Suggestions.

Exercise – IV

CALL Lab:

Understand: Listening for General Details.

Practice: Listening Comprehension Tests.

Testing Exercises

ICS Lab:

Understand: Public Speaking–Exposure to Structured Talks - Non-verbal Communication- Presentation Skills.

Practice: Making a Short Speech–Extempore- Making a Presentation.

Exercise – V

CALL Lab:

Understand: Listening for Specific Details.

Practice: Listening Comprehension Tests.

Testing Exercises

ICS Lab:

Understand: Group Discussion- Interview Skills.

Practice: Group Discussion- Mock Interviews.

Minimum Requirement of infrastructural facilities for ELCS Lab:

1. **Computer Assisted Language Learning (CALL) Lab:**

   The Computer Assisted Language Learning Lab has to accommodate 40 students with40 systems, with one Master Console, LAN facility and English language learning software for self- study by students.

   System Requirement (Hardware component):

   Computer network with LAN facility (minimum 40 systems with multimedia) with the following specifications:

   Computers with Suitable

   Configuration High Fidelity

   Headphones

2. **Interactive Communication Skills (ICS) Lab:**

   The Interactive Communication Skills Lab: A Spacious room with movable chairs and audio-visual aids with a Public Address System, a T. V. or LCD, a digital stereo –audio and video system and camcorder etc.

Lab Manuals:

1. A book entitled "***ELCS Lab Manual– A Workbook for CALL and ICS Lab Activities"*** by Board of Editors: Hyderabad: Orient BlackSwan Pvt. Ltd. 2016. Print.
2. Hart, Steve; Nair, Aravind R.; Bhambhani, Veena. ***"EMBARK- English for***

undergraduates" Delhi: Cambridge University Press. 2016. Print.

Suggested Software:

3. Cambridge Advanced Learners' English Dictionary with CD.
4. Grammar Made Easy by Darling Kindersley.
5. Punctuation Made Easy by Darling Kindersley.
6. Oxford Advanced Learner's Compass, 8th Edition.
7. English in Mind (Series 1-4), Herbert Puchta and Jeff Stranks with Meredith Levy, Cambridge.
8. English Pronunciation in Use (Elementary, Intermediate, Advanced) Cambridge University Press.
9. TOEFL and GRE (KAPLAN, AARCO and BARRONS, USA, Cracking GRE by CLIFFS).

REFERENCES:

1. Jayashree Mohanraj. *Let Us Hear Them Speak*. New Delhi: Sage Texts. 2015. Print.
   Hancock, M. *English Pronunciation in Use. Intermediate Cambridge*: Cambridge University Press. 2009. Print.

Course Outcomes:

The student will be able to:

1. Acquire articulation, stress, intonation and pronunciation through phonetics.
2. Express the audience through public speaking.
3. Defined the influence of mother tongue.
4. Differentiate British from us English.
5. Develop the right body language supporting their verbal as well as non-verbal communication.

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B.Tech. IT	**L**	**T-P-D**	**C**
I Year - I Semester	**0**	**0-3-0**	**2**

(E1102) ENGINEERING WORKSHOP

(Common to EEE,ECE,CSE,IT&ECM)

Course Objectives:

The student will:

1. Execute application of various tools in carpentry, lathe machine works, house wiring.
2. Recognize application of metal cutting and drilling.
3. Analyse to perform various shape of wood material and metals.
4. Fabricate metal items using welding and power tools.
5. Demonstrate the works in foundry and plumbing.

TRADES FOR EXERCISES:

1) Carpentry
2) Fitting
3) Tin-Smithy and Development of jobs carried out and soldering.
4) Black Smithy
5) House-wiring
6) Foundry
7) Welding

TRADES FOR DEMONSTRATION AND EXPOSURE:

Plumbing, Machine Shop, Power tools in construction, wood working and mechanical engineering.

Course Outcomes:

The student will be able to:

1. Identify the tools used in workshop of different trades.
2. Perform the carpentry works of small shape and size.
3. Perform the basic fitting and electrical works using the required tools.
4. Perform welding works both gas and electrical.
5. Perform the minor foundry and plumbing works using the required tools.

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B.Tech. IT	**L**	**T-P-D**	**C**
I Year - I Semester	**2**	**0-0-0**	**0**

(E110E) ENVIRONMENTAL STUDIES

(Common to CSE,ME,IT&MIE)

Course objectives:

The student will:

1. Discover about the different natural resources available and how to use them.
2. Reads about biodiversity.
3. Reads about environmental impact assessment and management.
4. Studies about the global environmental problems.
5. Studies about sustainability.

UNIT-I : Ecosystems, Natural Resources & **Biodiversity** concept, Classification of Resources: Water resources, Land resources, Forest resources, Mineral resources , Energy resources.

Concept of ecosystem: Classification of ecosystem, Functions of ecosystem. Biodiversity, levels, hotspots, values of biodiversity, threats to biodiversity, conservation of biodiversity.

UNIT-II: Global Environmental Problems And Global Efforts

Deforestation Green house effect, Global Warming, Sea level rise, Ozone depletion. International conventions/protocols green-belt-development, Concept of Green Building, Clean Development Mechanism (CDM).

Environmental Impact Assessment (Eia) And Environmental Management Plan: definition of Impact, classification of impacts, methods of baseline data acquisition. Impacts on different components: such as human health resources, air, water, flora, fauna and society, impact assessment methodologies. Environmental management plan (EMP)

UNIT-III: **Environmental Policy, Legislation, Rules And Regulations & Towards Sustainable Future**

Concept of Sustainable Development, Threats to Sustainability, Strategies for achieving Sustainable development, Environmental Ethics, Environmental Economics, Concept of Green Computing.

TEXT BOOKS:

1. Text Book Of Environmental Science And Technology By M.Anji Reddy 2007
2. Principles of Environmental Science and Engineering by P.Venugopal Rao
3. Introduction to Environmental Studies by K.Mukkanti
4. Text book of Environmental Studies by Kaushik & Anubha Kaushik

RFERENCES:

1. Tata McGraw-Hill : Introduction to Environmental Studies by Benny Joseph
2. Environmental studies by ErachBharucha 2005, University Grants Commission, University Press

Course outcomes:

The student will be able to:

1. Identify the importance of natural resources and use them efficiently.
2. Understand the concept of biodiversity.

3. Apply environmental plan in developing any sort of environmental projects.
4. Solve the sources and risks caused by pollution.
5. Apply the environmental legislation in every walk of life and importance of sustainability.

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B.Tech. IT	**L**	**T-P-D**	**C**
I Year - II Semester	**3**	**0-0-0**	**3**

(E120A) ENGINEERING PHYSICS – II

(Common to EEE, ECE,CSE,IT&ECM)

Course Objectives:

The students will:

1. Understand the behavior of a particle quantum mechanically.
2. Distinguish pure and impure semi conductors and understand formation of p-n junction.
3. Understand various magnetic and dielectric properties of materials.
4. Read super conductor behavior of materials.
5. Practical focus in this curriculum is on nano structured materials, their structural and mechanical properties, and their applications.

UNIT - I: Principles of Quantum Mechanics

Waves and particles, de-Broglie hypothesis, matter waves, Davisson and Germer experiment, Heisenberg uncertainty principle, Schrodinger time independent wave equation, physical significance of wave function, particle in 1-D potential box, electron in periodic potential, Kronig-Penny model (qualitative treatment), E-K curve, origin of energy band formation in solids.

UNIT - II: Semiconductor Physics

Fermi level in intrinsic and extrinsic semiconductors, calculation of carrier concentration in intrinsic & extrinsic semiconductors, direct and indirect band gap semiconductors, formation of PN junction, open circuit PN junction, energy diagram of PN junction diode, solar cell: I-V characteristics and applications.

UNIT - III: Dielectric Properties

Electric dipole, dipole moment, dielectric constant, polarizability, electric susceptibility, displacement vector, electronic, ionic and orientation polarizations and calculation of their polarizabilitites, internal field, Clausius-Mossotti relation, Piezoelectricity, pyroelectricity and ferroelectricity-$BaTiO_3$ structure.

UNIT - IV: Magnetic Properties & Superconductivity

Permeability, field intensity, magnetic field induction, magnetization, magnetic susceptibility, origin of magnetic moment, Bohr magneton, classification of dia, para and ferro magnetic materials on the basis of magnetic moment, hysteresis curve based on domain theory, soft and hard magnetic materials, properties of anti-ferro and ferri magnetic materials, Superconductivity: Superconductivity phenomenon, Meissner effect, applications of superconductivity

UNIT - V: Introduction to nanoscience:

Origin of nanoscience, nanoscale, surface to volume ratio, quantum confinement, dominance of electromagnetic forces, random molecular motion, bottom-up fabrication: Sol-gel, CVD and PVD techniques, top-down fabrication: ball mill method, characterization by XRD, SEM and TEM.

TEXT BOOKS:

1. Solid State Physics, A. J. Dekkar, Macmillan publishers Ind. Ltd.,
2. Solid State Physics, Chales Kittel, Wiley student edition.
3. Fundamentals of Physics, Alan Giambattisa, BM Richardson and Robert C Richardson,Tata McGraw hill Publishers.

REFERENCES:

1. Modern Engineering Physics, K. Vijaya Kumar, S. Chandralingam S. Chand & Co. Pvt. Ltd.,
2. University Physics, Francis W. Sears, Hugh D. Young, MarleZeemansky and Roger A Freedman, Pearson Education.
3. Fundamentals of Acoustics, Kinster and Frey, John Wiley and Sons.
4. Introduction to Quantum Mechanics Leonard I. Schiff McGraw-Hill.

Course Outcomes:

The student will be able to:

1. Realize the importance of behavior of a particle quantum mechanically.
2. Estimate concentration estimation of charge carriers in semi conductors.
3. Categorize various magnetic dielectric properties and apply them in engineering applications.
4. Analyze the basic principles and applications of super conductors.
5. Demonstrate a working knowledge of nanotechnology principles and industry applications.

J.B. INSTITUTE OF ENGINEERING & TECHNOLOGY
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B.Tech. IT	**L**	**T-P-D**	**C**
I Year - II Semester	**4**	**1-0-0**	**4**

(E120B) MATHEMATICS – II

(Common to EEE, ECE,CSE,IT&ECM)

Course Objectives:

The Student will:

1. Understand the concepts & properties of Laplace transforms and solving differential equations using Laplace transform techniques.
2. Examine the evaluation of integrals using beta and gamma functions.
3. Describe multiple integrals and applying them to compute the volume and areas of regions and the physical quantities involved in engineering field related to the vector valued functions.
4. Evaluate the basic properties of vector valued functions and their applications.
5. Describe the Vector integral theorems on line, surface and volume integrals

UNIT–I: Laplace Transforms

Laplace transforms of standard functions, Shifting theorems, derivatives and integrals, properties- Unit step function, Dirac's delta function, Periodic function, Inverse Laplace transforms, Convolution theorem (without proof).

Applications: Solving ordinary differential equations (initial value problems) using Laplace transforms.

UNIT-II: Beta and Gamma Functions

Beta and Gamma functions, properties, relation between Beta and Gamma functions, evaluation of integrals using Beta and Gamma functions.

Applications: Evaluation of integrals.

UNIT–III: Multiple Integrals

Double and triple integrals, Change of variables, Change of order of integration.

Applications: Finding areas, volumes& Center of gravity (evaluation using Beta and Gamma functions).

UNIT–IV: Vector Differentiation

Scalar and vector point functions, Gradient, Divergence, Curl and their physical and geometrical interpretation, Laplacian operator, Vector identities.

UNIT–V: Vector Integration Line Integral, Work done, Potential function, area, surface and volume integrals, Vector integral theorems: Greens, Stokes and Gauss divergence theorems (without proof) and related problems.

TEXT BOOKS:

1. Advanced Engineering Mathematics by R K Jain & S R K Iyengar, Narosa Publishers.
2. Engineering Mathematics by Srimanthapal and Subodh C. Bhunia, Oxford Publishers.

REFERENCES:

1. Advanced Engineering Mathematics by Peter V. O. Neil, Cengage Learning Publishers.
2. Advanced Engineering Mathematics by Lawrence Turyn, CRC Press

Course Outcomes:

The student will be able to:

1. Use laplace transform techniques for solving de's.
2. Evaluate integrals using beta and gamma functions.
3. Evaluate the multiple integrals and can apply these concepts to find areas, volumes, moment of inertia etc of regions on a plane or in space.
4. Calculate the unit tangent vector, the unit normal vector and the unit binomial vector at a point on a space curve described by a vector-valued position function.
5. Analyze the line, surface and volume integrals and converting them from one to another.

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B.Tech. IT	**L**	**T-P-D**	**C**
I Year - II Semester	**4**	**1-0-0**	**4**

(E120C) MATHEMATICS – III

(Common to CE,EEE,ME, ECE,CSE,IT,ECM& MIE)

Course objectives:

The student will:

1. Understand random variables that describe randomness or an uncertainty in certain realistic situation and binomial geometric and normal distributions.
2. Formulate sampling distribution of mean, variance, point estimation and interval estimation and the testing of hypothesis and anova.
3. Describe the topics that deals with methods to find roots of an equation.
4. Discuss how to fit a desired curve by the method of least squares for the given data.
5. Identify how to solve ordinary differential equations using numerical techniques.

UNIT–I: Random variables and Distributions

Introduction, Random variables, Discrete random variable, Continuous random variable, Probability, Distribution function, Probability density function, Expectation, Moment generating function, Moments and properties. Discrete distributions: Binomial and geometric distributions. Continuous distribution: Normal distributions.

UNIT – II: Sampling Theory

Introduction, Population and samples, Sampling distribution of means (σKnown)-Central limit theorem, t-distribution, Sampling distribution of means (σunknown)-Sampling distribution of variances – $\chi^2$and F- distributions, Point Estimation, Maximum error of estimate, Interval estimation.

UNIT – III: Tests of Hypothesis

Introduction, Hypothesis, Null and Alternative Hypothesis, Type I and Type II errors,
Level of significance, One tail and two-tail tests, Tests concerning one mean and proportion, two means -proportions and their differences-ANOVA for one-way classified data.

UNIT – IV: Algebraic and Transcendental Equations & Curve Fitting

Introduction, Bisection Method, Method of False position, Iteration methods: fixed point iteration and Newton Raphson methods. Solving linear system of equations by
Gauss-Jacobi and Gauss-Seidal Methods.

Curve Fitting: Fitting a linear, second degree, exponential, power curve by method of least squares.

UNIT – V: Numerical Integration and solution of Ordinary Differential equations

Trapezoidal rule-Simpson's 1/3rd and 3/8th rule- Solution of ordinary differential equations by Taylor's series, Picard's method of successive approximations, Euler's method, Runge-Kutta method (second and fourth order)

TEXT BOOKS:

1. Probability and Statistics for Engineers by Richard Arnold Johnson, Irwin Miller and John E. Freund, New Delhi, Prentice Hall.
2. Probability and Statistics for Engineers and Sciences by Jay L. Devore, Cengage

Learning.

3. Numerical Methods for Scientific and Engineering Computation by M. K. Jain, S. R.
4. K. Iyengar and R. K. Jain, New Age International Publishers

REFERENCES:

1. Fundamentals of Mathematical Statistics by S. C. Guptha& V. K. Kapoor, S. Chand.
2. Introductory Methods of Numerical Analysis by S. S. Sastry, PHI Learning Pvt. Ltd.
3. Mathematics for engineers and scientists by Alan Jeffrey, 6th edition, CRC press.

Course outcomes:

The student will be able to:

1. Differentiate among random variables involved in the probability models which are useful for all branches of engineering.
2. Evaluate mean, proportions and variances of sampling distributions and to make Important decisions for few samples which are taken from a large data.
3. Solve the tests of anova for classified data.
4. Identify the root of a given equation and solution of a system of equations.
5. Design a curve for a given data Identify the numerical solutions for a given first order initial value problem.

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B.Tech. IT	**L**	**T-P-D**	**C**
I Year - II Semester	**3**	**0-0-0**	**3**

(E125A) COMPUTER PROGRAMMING IN C

(Common to EEE,ECE,CSE,IT&ECM)

Course objectives:

The student will:

1. Understand the fundamentals of computers.
2. Read the fundamentals of c programming such as variables, constants, basic data types, selection statements, repetition statements etc.
3. Study the need for user-defined functions and understand the concept of arrays and its memory organization
4. Read the significance of pointers and describe about various character and string functions.
5. Understand the concept of structures and unions.

UNIT - I:

Introduction to Computers – Computer Systems, Computing Environments, Computer Languages, Creating and running programs, Program Development, algorithms and flowcharts , Number systems-Binary, Decimal, Hexadecimal and Conversions, storing integers and real numbers.

Introduction to C Language – Background, C Programs, Identifiers, Types, Variables, Constants, Input / Output, Operators(Arithmetic, relational, logical, bitwise etc.), Expressions, Precedence and Associativity, Expression Evaluation, Type conversions, Statements- Selection Statements(making decisions) – if and switch statements, Repetition statements (loops)-while, for, do-while statements, Loop examples, other statements related to looping – break, continue, goto, Simple C Program examples.

UNIT - II:

Functions:-Designing Structured Programs, Functions, user defined functions, inter function communication, Standard functions, Scope, Storage classes-auto, register, static, extern, scope rules, type qualifiers, recursion- recursive functions, Limitations of recursion, example C programs.

Arrays – Concepts, using arrays in C, inter function communication, array applications-linear search, binary search and bubble sort, two – dimensional arrays, multidimensional arrays, C program examples.

UNIT - III:

Pointers – Introduction (Basic Concepts), Pointers for inter function communication, pointers to pointers, compatibility, Pointer Applications-Arrays and Pointers, Pointer Arithmetic and arrays, Passing an array to a function, memory allocation functions, array of pointers, programming applications, pointers to void, pointers to functions.

Strings – Concepts, C Strings, String Input / Output functions, arrays of strings, string manipulation functions, string / data conversion, C program examples.

UNIT - IV:

Enumerated, Structure ,and Union Types– The Type Definition (typedef), Enumerated

types, Structures –Declaration, initialization, accessing structures, operations on structures, Complex structures-Nested structures, structures containing arrays, structures containing pointers,

Arrays of structures, structures and functions, Passing structures through pointers, self referential structures, unions, bit fields, C programming examples, command–line arguments, Preprocessor commands.

UNIT – V:

Input and Output – Concept of a file, streams, text files and binary files, Differences between text and binary files, State of a file, Opening and Closing files, file input / output functions (standard library input / output functions for files).

File status functions (error handling), Positioning functions (fseek ,rewind and ftell), C program examples.

TEXT BOOKS:

1. Computer Science: A Structured Programming Approach Using C, B.A. Forouzan and R. F. Gilberg, Third Edition, Cengage Learning.
2. Programming in C. P. Dey and M Ghosh , Second Edition, Oxford University Press.

REFERENCES:

1. The C Programming Language, B.W. Kernighan and Dennis M. Ritchie, Second Edition, Pearson education.
2. Programming with C, B. Gottfried, 3rd edition, Schaum's outlines, McGraw Hill Education(India) Pvt Ltd.
3. C From Theory to Practice, G S. Tselikis and N D. Tselikas, CRC Press.

Course outcomes:

The student will be able to:

1. Demonstrate the basic knowledge of computer hardware and software.
2. Write effective programs using c programming language.
3. Choose between different argument passing mechanisms and use multidimensional arrays.
4. Make use pointers with arrays and apply various character and string functions.
5. Differentiate between structures and unions.

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B.Tech. : IT	**L**	**T-P-D**	**C**
I Year - II Semester	**2**	**0-0-3**	**4**

(E123A) ENGINEERING DRAWING

(Common to EEE,ECE,CSE,IT&ECM)

Course Objectives:

The student will:

1. Understand basic knowledge of conventions used in engineering graphics, constructing engineering scales and various methods in getting engineering curves.
2. Identify the different angles of projections, conventions and the position of objects in various planes.
3. Distinguish the different orientations of two dimensional planes and right regular solids at different inclinations with respect to projection planes able to identify the internal features of object.
4. Analyze the size and shape of required sheet to form a right regular solid.
5. Solving the typical problems from 3-dimensional view to simplified 2-dimensional view and vice versa.

UNIT – I: INTRODUCTION TO ENGINEERING DRAWING

Principles of Engineering Drawing and their Significance – Drawing Instruments and their Use – Conventions in Drawing – Lettering – BIS Conventions.

CONSTRUCTION OF CURVES USED IN ENGINEERING PRACTICE:

a) Conic Sections, Ellipse- General, Concentric Circle, Arcs of circle and Oblong Method Parabola- General, Tangent and Rectangle Methods, Hyperabola-General, Point/Rectangle Method

b) Cycloid, Epicycloids and Hypocycloid

c) Involutes for Circle, Rectangle and Triangle

UNIT – II: PROJECTIONS OF POINTS AND LINES

Principles of Orthographic Projections – Conventions – First and Third Angle, Projections of Points and Lines inclined to planes, True lengths, traces.

UNIT – III: PROJECTIONS OF PLANES

Projections of regular Planes, auxiliary planes and Auxiliary projection inclined to both planes.

UNIT –IV: PROJECTIONS OF SOLIDS

Projections of Regular Solids inclined to both planes – Auxiliary Views.

UNIT- V: ISOMETRIC PROJECTIONS

Principles of Isometric Projection – Isometric Scale – Isometric Views– Conventions – Isometric Views of Lines, Plane Figures, Simple and Compound Solids – Isometric Projection of objects having non- isometric lines. Isometric Projection of Spherical Parts.

ORTHOGRAPHIC PROJECTIONS: Conversion of Isometric Views to Orthographic Views – Conventions.

TEXT BOOKS :

1. Engineering Drawing, N.D. Bhat / Charotar

2. Engineering Drawing and Graphics, Venugopal / New age.
3. Engineering Drawing – Basant Agrawal, TMH

REFERENCES:

1. Engineering drawing – P.J. Shah.S.Chand.
2. Engineering Drawing, Narayana and Kannaiah / Scitech publishers.
3. Engineering Drawing- Johle/Tata Macgraw Hill.
4. Computer Aided Engineering Drawing- Trymbaka Murthy- I.K. International.

Course Outcomes:

The student will be able to:

1. Construct scales and can draw the objects of various sizes in a prescribe given size of sheet. And also can know how to get various curves used in engineering design.
2. Illustrate the projections of point and line in different positions and different inclinations respectively. Construct traces of lines.
3. Identify the projections of plane and solid with different positions of surfaces edges and axis with respect to reference planes.
4. Sketch the sectional views to view inside features of right regular syllabus.
5. Identify the objects of complicated shape and to draw the same in 2-diemnsional. view. Can draw 3-diemensional views and isometric projections by observing front view and top view (2-dimensional views).

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B.Tech. IT	**L**	**T-P-D**	**C**
I Year - II Semester	**0**	**0-3-0**	**2**

(E1203) COMPUTER PROGRAMMING IN C LAB

(Common to EEE,ECE,CSE,IT & ECM)

Course Objective:

The student will :

1. Implement linked list, stack , queue, tree.
2. Develop programming skills using the fundamentals and basics of c language.
3. Change character strings in c programs.
4. Use pointers to efficiently solve problems.
5. Memorize functions from the portable c library and to describe the techniques for creating program modules using functions and recursive functions.

Recommended Systems/Software Requirements:

- Intel based desktop PC
- GNU C Compiler

1. a) Write a C program to find the factorial of a positive integer.
   b) Write a C program to find the roots of a quadratic equation.
2. a) Write a C program to determine if the given number is a prime number or not.
   b) A Fibonacci sequence is defined as follows: the first and second terms in the sequence are 0 and 1. Subsequent terms are found by adding the preceding two terms in the sequence. Write a C program to generate the first n terms of the sequence.
3. a) Write a C program to construct a pyramid of numbers.
   b) Write a C program to calculate the following Sum: Sum=$1-x^2/2! +x^4/4!-x^6/6!+x^8/8!-x^{10}/10!$
4. a) The least common multiple (lcm) of two positive integers a and b is the smallest integer that is evenly divisible by both a and b. Write a C program that reads two integers and calls lcm (a, b) function that takes two integer arguments and returns their lcm. The lcm (a, b) function should calculate the least common multiple by calling the gcd (a, b) function and using the following relation:CM (a,b) = ab / gcd (a,b)
   b) Write a C program that reads two integers n and r to compute the ncr value using the following relation: ncr (n,r) = n! / r! (n-r)! . Use a function for computing the factorial value of an integer.
5. a) Write C program that reads two integers x and n and calls a recursive function to compute xn
   b) Write a C program that uses a recursive function to solve the Towers of Hanoi problem.
   c) Write a C program that reads two integers and calls a recursive function to compute ncr value.
6. a) Write a C program to generate all the prime numbers between 1 and n, where n is

a value supplied by the user using Sieve of Eratosthenes algorithm.

b) Write a C program that uses non recursive function to search for a Key value in a given list of integers. Use linear search method.

7. a) Write a menu-driven C program that allows a user to enter n numbers and then choose between finding the smallest, largest, sum, or average. The menu and all the choices are to be functions. Use a switch statement to determine what action to take. Display an error message if an invalid choice is entered.

   b) Write a C program that uses non recursive function to search for a Key value in a given sorted list of integers. Use binary search method.

8. a) Write a C program that implements the Bubble sort method to sort a given list of Integers in ascending order.

   b) Write a C program that reads two matrices and uses functions to perform the following:

      i) Addition of two matrices

      ii) Multiplication of two matrices

9. a) Write a C program that uses functions to perform the following operations:

      i) to insert a sub-string into a given main string from a given position.

      ii) to delete n characters from a given position in a given string.

   b) Write a C program that uses a non recursive function to determine if the given string is a Palindrome or not.

10. a) Write a C program to replace a substring with another in a given line of text.

    b) Write a C program that reads 15 names each of up to 30 characters, stores them in an array, and uses an array of pointers to display them in ascending (ie. alphabetical) order.

11. a) 2's complement of a number is obtained by scanning it from right to left and Complementing all the bits after the first appearance of a 1. Thus 2's complement of 11100 is 00100. Write a C program to find the 2's complement of a binary number.

    b) Write a C program to convert a positive integer to a roman numeral. Ex. 11 is converted to XI.

12. a) Write a C program to display the contents of a file to standard output device.

    b) Write a C program which copies one file to another, replacing all lowercase characters with their uppercase equivalents.

13. a) Write a C program to count the number of times a character occurs in a text file. The file name and the character are supplied as command-line arguments.

    b) Write a C program to compare two files, printing the first line where they differ.

14. a) Write a C program to change the nth character (byte) in a text file. Use fseek function.

    b) Write a C program to reverse the first n characters in a file. The file name and n are specified on the command line. Use fseek function.

15. a) Write a C program to merge two files into a third file (i.e., the contents of the first file followed by those of the second are put in the third file).

    b) Define a macro that finds the maximum of two numbers. Write a C program that uses the macro and prints the maximum of two numbers.

REFERENCES:

1. Mastering C, K.R. Venugopal and S.R. Prasad, TMH Publishers.
2. Computer Programming in C, V. Rajaraman, PHI.

3. Programming in C, Stephen G. Kochan, Fourth Edition, Pearson Education.
4. C++: The complete reference, H. Schildt, TMH Publishers.

Course Outcomes

The student will be able to:

1. Write, compile and debug programs using different programming constructs in C language.
2. Design programs using modular structures.
3. Apply and practice logical ability to solve the problems using C.
4. Design and present the algorithms flow charts and programs.
5. Apply operations like searching, insertion, deletion, traversing mechanism etc. on various data structures.

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B.Tech. IT	**L**	**T-P-D**	**C**
I Year – II Semester	**2**	**0-0-0**	**0**

(E120F) PROFESSIONAL ETHICS

(Common to ME ,CSE,IT & MIE)

Course objectives:

The student will :

1. Learn ethical values and attitudes.
2. Understand the roles of a professional.
3. Understand the current scenario and engineers responsibility towards the society
4. Know the types of professional ethical codes.
5. Learn the need for ethical audit.

UNIT - I:Basic Concepts

Introduction, Ethics-Ethical Dilemma-Morals, , emotional, intelligence, Indian and western thoughts on ethics, value education, domains of learning, human values, attitudes, Basic Ethical Principles. Meaning of profession, professionalism, professional's roles and professional risks, professional accountability, successful professional, engineering professionals, engineering ethics, roles of engineers.

UNIT - II: Global issues and safety

Introduction, current scenario, business ethics, environmental ethics, computer ethics, ethical hacking and its dilemma,, ethics in research, intellectual property rights, patents, trademarks, managers and engineers responsibility , Engineering ethics.

UNIT - III: Ethical codes and audits

Introduction need and types of professional ethical codes, sample standard codes, ethical codes for corporate entities and non-profit organization, charitable institutions, limitations of the codes, need for ethical audit, ethical profile of organizations.

REFERENCES:

1. Professional ethics and human value by D.R.Kiran, Tata McGraw Hills education.
2. Ethics in engineering by Mike W. Martin and Roland Schinzinger, Tata McGraw Hills education.
3. Fundamental of Ethics by Edmund G Seebauer and Robert L.Barry, Oxford university press.
4. Professional ethics and human values by R.S.Nagarajan, New age international.
5. Professional ethics by R. Subramanian, Oxford press.

Course outcomes:

The student will be able to:

1. Make use of ethical values and attitudes in their life.
2. Implement once he/she becomes a professional.
3. Solve the issues related with environment and technology
4. Apply the different types of professional ethical codes in their organization.
5. Make use of the rules framed by the auditors.

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B.Tech. IT	**L**	**T-P-D**	**C**
II Year - I Semester	**3**	**1-0-0**	**3**

(E210C) Complex Analysis and Discrete Mathematics
(Common to IT & CSE)

Course Objectives

The students will :

1. Define the maximum flow in a transport network and determine the corresponding minute by designing an algorithm.
2. Explain about lattices and complete partial orderings which are the correct frame work for a study of denotational semantics of programming languages.
3. Discuss the solution of difference equations by using-transforms.
4. Describe the differentiation of the complex functions.
5. Describe the complex line integrals and use the residue theorem.

UNIT–I:

Graph Theory

Introductions-Concepts-Definitions-Basic Result-Trees-and Cut sets-Definitions and basic results of Lattice Theory.

UNIT–II:

Z-Transforms

Introduction-Definition-Some standard Z-Transforms-Linearity Property-Damping Rule-some standard result-Shifting u_n to the right and to the left Multiplication by n-Two basic theorems (Initial and Final) – Some useful Z-transforms-Some useful inverse Z-transforms-Convolution Theorem-Convergence of Z-Transforms-Two side Z-Transform-Evaluation of Z-Transforms- Applications to Difference Equations

UNIT–III:

Functions of a complex variable

Continuity – Differentiability – Analyticity – Properties – Cauchy-Riemann conditions, Maxima – Minima principle, Harmonic and conjugate harmonic functions – Milne – Thompson method

UNIT–IV:

Complex integration

Line integral – evaluation along a path and by indefinite integration – Cauchy's integral theorem – Cauchy's integral formula – Generalized integral formula. Radius of convergence – Expansion in Taylor's series, Maclaurin's series and Laurent series

UNIT-V:

Complex power series

Singular point –Isolated singular point – pole of order m – essential singularity. (Distinction between the real analyticity and complex analyticity)

Contour Integration

Residue – Evaluation of residue by formula and by Laurent series - Residue theorem, Evaluation of integrals of the type

(a)Improper real integrals $\int_{-\infty}^{\infty} f(x)dx$ (b) $\int_{c}^{c+2\pi} f(\cos\theta, \sin\theta)d\theta$

UNIT–IV:

Complex integration

Line integral – evaluation along a path and by indefinite integration – Cauchy's integral theorem – Cauchy's integral formula – Generalized integral formula. Radius of convergence – Expansion in Taylor's series, Maclaurin's series and Laurent series

UNIT-V:

Complex power series

Singular point –Isolated singular point – pole of order m – essential singularity. (Distinction between the real analyticity and complex analyticity)

Contour Integration

Residue – Evaluation of residue by formula and by Laurent series - Residue theorem, Evaluation of integrals of the type

(a)Improper real integrals $\int_{-\infty}^{\infty} f(x)dx$ (b) $\int_{c}^{c+2\pi} f(\cos\theta, \sin\theta)d\theta$

Text Books:

1. Higher Engineering Mathematics by Dr. B. S. Grewal, KhannaPublishers.
2. Advanced Engineering Mathematics by E. Kreyszig, John Wiley and SonsPublisher

Reference Books:

1. Engineering Mathematics by N. P. Bali, LakshmiPublications.
2. Advanced Engineering Mathematics by H.K.Dass, S.ChandPublications

Course Outcomes:

The students will be able to:

1. Apply the knowledge in computer design.
2. Identify whether a given function is differentiable, and if so find its derivative. And use differentiation rules to compute derivatives.
3. Show complex-differentiable functions as power series. Use anti derivatives to compute line integrals and Cauchy's integral theorem and formula to compute line integrals.
4. Evaluate complex line integrals and real integrals by residue theorem.
5. Relate the relationship between transform and the Fourier transform for discrete-time signals and the characteristics and properties of transform.
6. Evaluate transform and inverse transform and apply transform for analyzing linear time invariant (LTI)system.

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B.Tech. IT	**L**	**T-P-D**	**C**
II Year - I Semester	**3**	**0-0-0**	**3**

(E216A) MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE
(Common to IT & CSE)

Course Objectives
The students will :

1. Understand the basic terminology of functions, relations and sets and to demonstrate the knowledge of their associated operations.
2. Understand the principles of permutations, combinations, inclusion/exclusion principle and the pigeonhole methodology.
3. Describe how to solve advanced mathematical problems, apply various methods of mathematical proof, and communicate solutions in writing.
4. Select graph theory basics in solving computer science problems.

UNIT - I:
Mathematical Logic:
Statements and notations, Connectives, Well formed formulas, Truth Tables, tautology, equivalence implication, Normal forms, Quantifiers, universal quantifiers.
Predicates:
Predicative logic, Free & Bound variables, Rules of inference, Consistency, proof of contradiction, Automatic Theorem Proving.

UNIT - II:
Relations:
Properties of Binary Relations, equivalence, transitive closure, compatibility and partial ordering relations, Lattices, Hasse diagram.
Functions:
Inverse Function Composition of functions, recursive Functions, Lattice and its Properties.
Algebraic structures:
Algebraic systems Examples and general properties, Semi groups and monoids, groups, sub groups, homomorphism, Isomorphism.

UNIT - III:
Elementary Combinatorics:
Basis of counting, Combinations & Permutations, with repetitions, Constrained repetitions,

Binomial Coefficients, Binomial Multinomial theorems, the principles of Inclusion – Exclusion. Pigeon hole principles and its application.

UNIT - IV:
Recurrence Relation:
Generating Functions, Function of Sequences Calculating Coefficient of generating function, Recurrence relations, solving recurrence relation by substitution and Generating funds. Characteristics roots solution of In homogeneous Recurrence Relation.

UNIT - V:

Graph Theory:

Representation of Graph, DFS, BFS, Spanning Trees, planar Graphs. Graph Theory and Applications, Basic Concepts Isomorphism and Sub graphs, Multi graphs and Euler circuits, Hamiltonian graphs, Chromatic Numbers.

Text Books:

1. **Elements of DISCRETE MATHEMATICS**- A computer Oriented Approach- C L Liu, D P Mohapatra. Third Edition, Tata Mc GrawHill.
2. **Discrete Mathematics** by RK Bisht, HS Dhami, Oxford University Press.

Reference Books:

1. **Discrete Mathematics for Computer Scientists & Mathematicians**, J.L. Mott, A. Kandel,
    a. T.P. Baker, PHI.
2. **Discrete and Combinational Mathematics**- An Applied Introduction-5th Edition – Ralph. P.Grimaldi.PearsonEducation
3. **Discrete Mathematics and its Applications**, Kenneth H. Rosen, FifthEdition.TMH.

Course Outcomes:

The students will be able to:

1. Apply logic expressions for a variety of applications.
2. Demonstrate data numerically and/or graphically.
3. Choose mathematical principles and logic design.
4. Use the notions of propositions and predicate formulae, satisfiability and formal proof.
5. Apply logical reasoning to solve a variety of problems to build an expert System.
6. Apply, adapt, and design elementary deterministic and randomized algorithms to solve computational problems.

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UGC AUTONOMOUS

B.Tech. IT	**L**	**T-P-D**	**C**
II Year - I Semester	**4**	**0-0-0**	**4**

(E215A) DATA STRUCTURES THROUGH C
(Common to IT &CSE)

Course Objectives

The students will :

1. Describe the appropriate data structure to solve problems in real world.
2. Explain the implementation of linear and non linear data structure mechanisms.
3. Discuss the various techniques of trees.
4. Describe various tree and graph traversal algorithms.
5. Explain several searching and sorting algorithms.

UNIT - I:

Data Structures – Introduction to Data Structures, abstract data types, Linear list – singly linked list implementation, insertion, deletion and searching operations on linear list, circular linked list implementation, Doubly linked list implementation, insertion, deletion and searching operations. Applications of linked lists.

UNIT - II:

Stacks-Operations, array and linked representations of stacks, stack applications-infix to postfix conversion, postfix expression evaluation, recursion implementation. Queues-operations, array and linked representations. Circular Queue operations, Dequeue, applications of queue

UNIT - III:

Trees – Definitions, Binary tree representation, Binary search tree, binary tree traversals, AVL tree – operations, B-tree – operations, B+ trees, Red Black tree.

UNIT - IV:

Graphs: Terminology, sequential and linked representation, graph traversals : Depth First Search & Breadth First Search implementation. Spanning trees, Prims and Kruskals method.

UNIT - V:

Searching and Sorting – Big O Notation, Sorting- selection sort, bubble sort, insertion sort, quick sort, merge sort, Searching-linear and binary search methods.

Text Books:

1. **Data Structures Using C** Reema Thareja, Oxford University Press, 2011Learning.
2. **Data Structures Using C** (Paperback) by Aaron M.Tenenbaum

Reference Books:

1. **C Programming & Data Structures**, B.A.Forouzan and R.F. Gilberg, Third Edition,Cengage
2. **C& Data structures** – P. Padmanabham, Third Edition, B.S.Publications.
3. **Data Structures using C** – A.M.Tanenbaum, Y.Langsam, and M.J. Augenstein, Pearson Education

Course Outcomes:

The students will be able to:

1. Analyze and apply appropriate data structures for solving computing problems.
2. Solve problems using various data structures like linear list, stack, queue, trees and graphs.
3. Solve problems independently.
4. Choose the best data structure for a particular task.
5. Categorize various searching and sorting techniques.

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B.Tech. IT	**L**	**T-P-D**	**C**
II Year - I Semester	**4**	**1-0-0**	**4**

(E216B) DIGITAL LOGIC DESIGN & COMPUTER ORGANIZATION
(Common for IT &CSE)

Course Objectives
The students will :

1. Discuss the fundamental knowledge of the basic structure and operation of a digital computer.
2. Explain logic expression and design combinational circuits.
3. Discuss operation of arithmetic unit including implementation of fixed-point and floating-point addition, subtraction, multiplication and division.
4. Classify different hierarchical memory systems including cache memory and virtual memory.
5. Recognize different ways of communicating with input/output devices and standard I/O interfaces.

UNIT - I:
Basic Structure of Computers
Computer Types, Functional units, Basic operational concepts, Bus structures, Software, Performance, multiprocessors and multi computers, Computer Generations. Data Representation: Binary Numbers Fixed Point Representation. Floating – Point Representation. Number base conversions, Octal and Hexadecimal Numbers, complements, Signed binary numbers, Binary codes.

UNIT - II:
Digital Logic Circuits - I
Basic Logic Functions, Logic gates, universal logic gates, Minimization of Logic expressions. Flip- flops, Combinational Circuits. Digital Logic Circuits -II: Registers, Shift Registers, Binary counters, Decoders, Multiplexers, Programmable Logic Devices.

UNIT - III:
Computer Arithmetic
Algorithms for fixed point and floating point addition, subtraction, multiplication and division operations. Hardware Implementation of arithmetic and logic operations, High performance arithmetic. Instruction Set & Addressing: Memory Locations and Addresses, Machine addresses and sequencing, Various Addressing Modes, Instruction Formats, Basic Machine Instructions. IA-32 Pentium example.

UNIT - IV:
Processor Organization
Introduction to CPU, Register Transfers, Execution of Instructions, Multiple Bus Organization, Hardwired Control, Micro programmed Control Memory Organization: Concept of Memory, RAM, ROM memories, memory hierarchy, cache memories, virtual memory, secondary storage, memory management requirements.

UNIT - V:
Input / Output Organization
Introduction to I/O, Interrupts- Hardware, Enabling and disabling Interrupts, Device Control, Direct memory access, buses, interface circuits, standard I/O Interfaces.

Text Books:

1. **Computer Organization** – Carl Hamacher, Zvonko Vranesic, Safwat Zaky, fifth edition, McGrawHill.
2. **Computer Architecture and Organization**- An Integrated Approach, Miles Murdocca, Vincent Heuring, Second Edition, WileyIndia.

Reference Books:

1. **Computer Systems Architecture** – M.Moris Mano, IIIrd Edition,Pearson
2. **Computer Organization and Architecture** – William Stallings Sixth Edition,Pearson
3. **Digital Logic Design & Computer Organization** with Computer Architecture for Security- Nikrouz Faroughi, McGrawHillEducation

Course Outcomes

The students will be able to:

1. Illustrate basic structure of digital computer.
2. Apply knowledge of different digital logic circuits.
3. Apply arithmetic operations of binary number systems.
4. Show organization of control unit and arithmetic logic unit.
5. Produce knowledge on input/output organization.

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B.Tech. IT	**L**	**T-P-D**	**C**
II Year - I Semester	**4**	**1-0-0**	**4**

(E215B) DATABASE MANAGEMENT SYSTEMS

(Common for IT &CSE)

Course Objectives

The students will :

1. Understand the architecture and functioning of Database Management Systems as well as associated tools and techniques.
2. Understand and apply the principles of data modeling using Entity Relationship and develop a good database design.
3. Understand the use of Structured Query Language (SQL) and its syntax.
4. Apply Normalization techniques to normalize database.
5. Understand the need of Database processing and learn techniques for controlling the consequences of concurrent data access.

UNIT - I:

Data base System Applications, data base System VS file System – View of Data – Data Abstraction –Instances and Schemas – data Models – the ER Model – Relational Model – Other Models – Database Languages – DDL – DML – database Access for applications Programs – data base Users and Administrator – Transaction Management – data base System Structure – Storage Manager – the Query Processor

ER diagrams – Beyond ER Design Entities, Attributes and Entity sets – Relationships and Relationship sets – Additional features of ER Model – Concept Design with the ER Model

UNIT - II:

Introduction to the Relational Model

-Integrity Constraint Over relations – Enforcing Integrity constraints – Querying relational data – Logical data base Design – Introduction to Views – Destroying /altering Tables and Views.

Relational Algebra

-Selection and projection set operations – renaming – Joins – Division – Examples of Algebra overviews – Relational calculus – Tuple relational Calculus – Domain relational calculus – Expressive Power of Algebra and calculus.

UNIT - III:

Form of Basic SQL Query

-Examples of Basic SQL Queries – Introduction to Nested Queries – Correlated Nested Queries Set – Comparison Operators – Aggregative Operators – NULL values – Comparison using Null values – Logical connectivity's – AND, OR and NOT – Impact on SQL Constructs – Outer Joins – Disallowing NULL values – Complex Integrity Constraints in SQL Triggers and Active Data bases. **Schema refinement**

-Problems Caused by redundancy – Decompositions – Problem related to decomposition – reasoning about FDS – FIRST, SECOND, THIRD Normal forms – BCNF – Lossless join Decomposition – Dependency preserving Decomposition – Schema refinement in Data base Design – Multi valued Dependencies – FORTH Normal Form.

UNIT - IV:

Transaction Concept

-Transaction State- Implementation of Atomicity and Durability – Concurrent – Executions – Serializability- Recoverability– Implementation of Isolation – Testing for serializability- Lock – Based Protocols – Timestamp Based Protocols- Validation- Based Protocols – Multiple Granularity.

Recovery and Atomicity

-Log – Based Recovery – Recovery with Concurrent Transactions – Buffer Management – Failure with loss of nonvolatile storage-Advance Recovery systems- Remote Backup systems.

UNIT - V:

Data on External Storage

File Organization and Indexing – Cluster Indexes, Primary and Secondary Indexes – Index data Structures – Hash Based Indexing – Tree base Indexing – Comparison of File Organizations – Indexes and Performance Tuning- Intuitions for tree Indexes – Indexed Sequential Access Methods (ISAM) – B+ Trees: A Dynamic Index Structure.

Advanced Database Management System

Introduction to Distributed Database-Reference Architecture, fragmentation, Allocation, Joins

Text Books:

1. **Data base Management Systems**, Raghurama Krishnan, Johannes Gehrke, TATA McGrawHill 3rdEdition
2. **Data base System Concepts**, Silberschatz, Korth, McGraw hill, Vedition.

Reference Books:

1. **Data base Systems design,** Implementation, and Management, Peter Rob & Carlos Coronel 7thEdition.
2. **Fundamentals of Database Systems,** Elmasri Navrate Pearson Education
3. **Introduction to Database Systems,** C.J.Date PearsonEducation

Course Outcomes:

The students will be able to:

1. Apply basic concepts of database system.
2. Choose a data model and schemas in RDBMS.
3. Use RDBMS for developing industry applications.
4. Use of Structured Query Language SQL.
5. Analyze functional dependencies for designing a robust database
6. Illustrate transactions, concurrency control, and be able to do Database recovery and Query optimization.

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B.Tech. IT	**L**	**T-P-D**	**C**
II Year - I Semester	**0**	**0-3-0**	**2**

(E2119) DATA STRUCTURES THROUGH C LAB
(**Common to all branches)**

Course Objectives
The students will be able to:

1. Define the basic data structures like linked list, stack and queue.
2. Understand the fundamentals and applications of linked list, stacks and queues.
3. Classify prefix, infix and postfix expression formats.
4. Understand linked list, stack, queue, tree and graph data structures.
5. Understand the fundamentals of basic searching and sorting algorithms.

EXPERIMENT 1. Write a C program that uses functions to perform the following operations on singly linked list:
I)Creation II) Insertion III) Deletion IV) Traversal V) merge two single linked lists

EXPERIMENT2. Write a C program that uses functions to perform the following operations on doubly linked list.
I)Creation II) Insertion III) Deletion IV) Traversal

EXPERIMENT 3. Write a C program that uses functions to perform the following operations on circular linked list:
I)Creation II) Insertion III) Deletion IV) Traversal

EXPERIMENT4. Write a C program that implement stack operations using
I) Arrays II) Linked Lists

EXPERIMENT 5. I) Write a C program to convert infix expression to postfix expression using stack
II) Write a C program to evaluate postfix expression

EXPERIMENT 6. I) Programs using recursion
II)Write a C program to convert infix expression to prefix expression using stack

EXPERIMENT 7. Write a C program to implement Linear queue using
I) Arrays II) Linked Lists

EXPERIMENT 8. Write a C program to perform following operations on a circular Queue
I) insertion II) deletion III) search and count

EXPERIMENT 9. Write a C program to perform following operations on a circular De Queue
I)insertion II) deletion III) search and count

EXPERIMENT 10. I) Write a C program to implement Linear search
II) Write a C program to implement Binary Search

EXPERIMENT 11. Write C programs that implement the following sorting methods to sort a given list of integers in ascending order:
I) Bubble sort II) Selection sort III) Insertion Sort

EXPERIMENT 12. Write C programs that implement the following sorting methods to sort a given list of integers in ascending order:
I)Merge sort II) Quick sort

EXPERIMENT 13. I) Write a C Program to implement binary tree traversals
II) Write a C Program to implement AVL tree operations

EXPERIMENT 14. I) Implementation of a Graph representation using Adjacency Matrix
II) Write a C program to implement graph traversals.

Text Books:

1. **C Programming & Data Structures**, B.A.Forouzan and R.F. Gilberg, Third Edition, Cengage Learning.
2. **Data Structures Using C** (Paperback) by Aaron M.Tenenbaum

Reference Books:

1. **C& Data structures** – P. Padmanabham, Third Edition, B.S.Publications.
2. **Data Structures using C** –A.M.Tanenbaum, Y.Langsam, and M.J.Augenstein, Pearson Education /PHI
3. **C Programming & Data Structures**, E. Balagurusamy,TMH.

Course Outcomes

The students will be able to:

1. Demonstrate operations like searching, insertion, deletion, traversing mechanism etc on various data structures.
2. Use linear and non-linear data structures like stacks, queues, linked list etc.
3. Use appropriate data structure and algorithm to solve a problem.
4. Compute time complexity of Big-O notation.

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B.Tech. IT	**L**	**T-P-D**	**C**
II Year - I Semester	**0**	**0-3-0**	**2**

(E2120) DATABASE MANAGEMENT SYSTEMSLAB

(Common for IT &CSE)

Course Objectives

The students will :

1. Describe with the nuances of database environments towards an information-oriented data-processing oriented framework.
2. Explain about a good formal foundation on the relational model of data present SQL and procedural interfaces to SQL comprehensively.
3. Give the introduction to systematic database design approaches covering conceptual design, logical design and an overview of physical design and to motivate the students to relate all these to one or more commercial product environments as they relate to the developer tasks.
4. Discuss the concepts and techniques relating to query processing by SQL engines and present the concepts and techniques relating to ODBC and its implementations.
5. Discuss the concepts of transactions and transaction processing and to present the issues and techniques relating to concurrency and recovery in multi-user database environments.

This lab enables the students to practice the concepts learnt in the subject DBMS by developing a database for an example company named "Roadway Travels" whose description is as follows. The student is expected to practice the designing, developing and querying a database in the context of example database "Roadway travels". Students are expected to use "Oracle" database. Roadway Travels "Roadway Travels" is in business since 1997 with several buses connecting different places in India. Its main office is located in Hyderabad.

The company wants to computerize its operations in the following areas:

- Reservations and Ticketing
- Cancellations Reservations & Cancellation: Reservations are directly handled by booking office. Reservations can be made 30 days in advance and tickets issued to passenger. One Passenger/person can book many tickets (to his/her family). Cancellations are also directly handed at the booking office.In the process of computerization of Roadway

Travels you have to design and develop a Database which consists the data of Buses, Passengers, Tickets, and Reservation and cancellation details. You should also develop query's using SQL to retrieve the data from the database.

The above process involves many steps like

Analyzing the problem and identifying the Entities and Relationships

1. E-R Model
2. Relational Mode

The above process involves many steps like

3. Analyzing the problem and identifying the Entities and Relationships
4. E-R Model
5. Relational Model
6. Normalization
7. Creating the database
8. Querying. Students are supposed to work on these steps week wise and finally create a complete "Database System" to Roadway Travels.

Examples are given at every experiment for guidance to students.

Experiment – 1.

E-R Model

Analyze the problem carefully and come up with the entities in it. Identify what data has to be persisted in the database. This contains the entities, attributes etc.
Identify the primary keys for all the entities. Identify the other keys like candidate keys, partial keys, if any

Example: Entities:

1. BUS
2. Ticket
3. Passenger

Relationships:

1. Reservation
2. Cancellation

PRIMARY KEY ATTRIBUTES:

1. Ticket ID (Ticket Entity)
2. Passport ID (Passenger Entity)
3.

3.Bus NO(Bus Entity)

Apart from the above mentioned entities you can identify more. The above mentioned are few.

Note:

The student is required to submit a document by writing the Entities and Keys to the lab teacher.

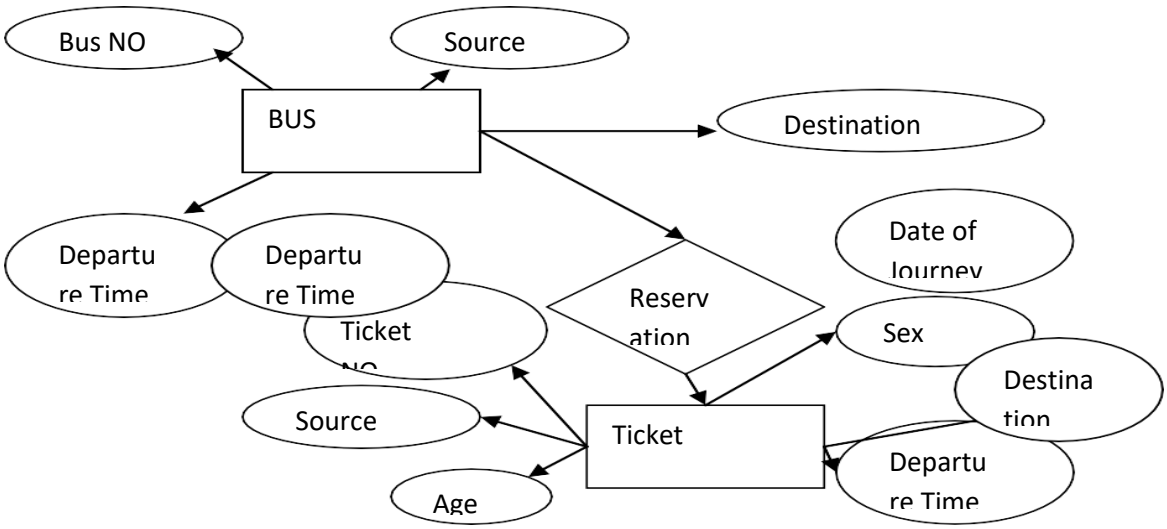
Experiment – 2.

Concept design with E-R Model

Relate the entities appropriately. Apply cardinalities for each relationship. Identify strong entities and weak entities (if any). Indicate the type of relationships (total / partial). Try to incorporate generalization, aggregation, specialization etc wherever required.

Example:

diagram for bus



Note: The student is required to submit a document by drawing the E-R Diagram to the lab teacher.

Experiment – 3.

Relational Model

Represent all the entities (Strong, Weak) in tabular fashion. Represent relationships in a tabular fashion. There are different ways of representing relationships as tables based on the cardinality. Represent attributes as columns in tables or as tables based on the requirement. Different types of attributes (Composite, Multi-valued, and Derived) have different way of representation.

Example:

The passenger tables look as below. This is an example. You can add more attributes based on your E-R model. This is not a normalized table.

Passenger

Name	Age	Sex	Address	Passport ID
				Ticket_id

Note:

The student is required to submit a document by Represent relationships in a tabular fashion to

the lab teacher.

Experiment – 4.

Normalization

Database normalization is a technique for designing relational database tables to minimize duplication of information and, in so doing, to safeguard the database against certain types of logical or structural problems, namely data anomalies. For example, when multiple instances of a given piece of information occur in a table, the possibility exists that these instances will not be kept consistent when the data within the table is updated, leading to a loss of data integrity. A table that is sufficiently normalized is less vulnerable to problems of this kind, because its structure reflects the basic assumptions for when multiple instances of the same information should be represented by a single instance only.

For the above table in the First normalization we can remove the multi valued attribute Ticket_id and place it in another table along with the primary key of passenger.

First Normal Form: The above table can be divided into two tables as shown below.

Passenger

Name	Age	Sex	Address	Passport ID

Passport ID	Ticket_id

You can do the second and third normal forms if required. Anyhow Normalized tables are given at theend.

Experiment - 5.

Installation of Mysql and Practicing DDL and DML commands

Installation of MySql. In this week you will learn Creating databases, How to create tables, altering the database, dropping tables and databases if not required. You will also try truncate, rename commands etc.

Example for creation of a normalized “Passenger” table.

```
CREATE TABLE Passenger(Passport_id      INTEGER PRIMARY KEY,
   Name VARCHAR (50) Not NULL,
   Age     Integer Not NULL,
   Sex     Char,
   Address VARCHAR (50) Not NULL);
```

Similarly create all other tables.

Note: Detailed creation of tables is given at the end.
Insert data into the above tables.

DML commands are used to for managing data within schema objects. Some examples:

- SELECT - retrieve data from the a database
- INSERT - insert data into a table
- UPDATE - updates existing data within a table
- DELETE - deletes all records from a table, the space for the records remain

Inserting values into "Bus" table

Insert into Bus values (1234,'hyderabad', 'tirupathi');
Insert into Bus values (2345,'hyderabd','Banglore');
Insert into Bus values (23,'hyderabd','Kolkata');
Insert into Bus values (45,'Tirupathi,'Banglore');
Insert into Bus values (34,'hyderabd','Chennai');

Inserting values into "Passenger" table:

Insert into Passenger values (1, 45,'ramesh', 45,'M','abc123');
Insert into Passenger values (2, 78,'geetha', 36,'F','abc124');
Insert into Passenger values (45, 90,'ram',30,'M','abc12');
Insert into Passenger values (67, 89,'ravi',50,'M','abc14');
Insert into Passenger values (56, 22,'seetha', 32,'F','abc55');

Few more Examples of DML commands

Select * from Bus; (selects all the attributes and display)
UPDATE BUS SET Bus No = 1 WHERE BUS NO=2;

Experiment 6. Querying

In this week you are going to practice queries (along with sub queries) using ANY, ALL, IN, Exists, NOT EXISTS, UNION, INTERSECT, Constraints etc.

Practice the following Queries:

1. Display unique PNR_no of all passengers.
2. Display all the names of male passengers.
3. Display the ticket numbers and names of all the passengers.
4. Find the ticket numbers of the passengers whose name start with 'r' and ends with'h'.
5. Find the names of passengers whose age is between 30 and45.
6. Display all the passengers names beginning with 'A'
7. Display the sorted list of passengers names

Experiment – 7. Querying (continued...)

You are going to practice queries using Aggregate functions (COUNT, SUM, AVG, and MAX and

MIN),GROUP BY, HAVING and Creation and dropping of Views.

1. Write a Query to display the Information present in the Passenger and cancellation tables. **Hint:** Use UNION Operator.
2. Display the number of days in a week on which the 9W01 bus is available.
3. Find number of tickets booked for each PNR_no using GROUPBYCLAUSE.
   Hint: Use GROUP BY on PNR_No.
4. Find the distinct PNR numbers that are present.
5. Find the number of tickets booked by a passenger where the number of seats is greater than 1.
   Hint: Use GROUP BY, WHERE and HAVINGCLAUSES.
6. Find the total number of cancelled seats.
7. Display the details of passengers who travelled within the last 3months.
8. Create a view for the details of passengers who cancelled their tickets.

Experiment – 8.

Create tables for the following schema. Student (ssum: integer, sname: string, major: string, level: string, age: integer) Class(name: string, meets at: time, room: string, fid: integer) Enrolled(snum: integer, cname: string) Faculty(fid: integer, fname: string, deptid: integer)

Experiment – 9. Querying

1. Find the names of all Juniors (Level = JR) who are enrolled in a class taught by I. Teacher.
2. Find the age of the oldest student who is either a History major or is enrolled in a course taught by I. Teacher.
3. Find the names of all classes that either meet in room R128 or have 5 or more students enrolled.
4. Find the names of all students who are enrolled in two classes that meet at the same time.
5. Find the names of faculty members who teach in every room in which some class is taught.
6. Find the names of faculty members for whom the combined enrollment of the courses that they teach is less than 5
7. Print the Level and the average age of students for that Level, for each Level.
8. Print the Level and the average age of students for that Level, for all Levels except JR.9
9. Print the Level and the average age of students for that Level, whose average age is greater than20.
10. Find the names of students who are enrolled in the maximum number of classes.
11. Find the names of students who are not enrolled in any class.
12. Count the number of junior level students.
13. Display all the students whose names starts with the letter's".
14. Display all the teachers whose names contain letter 'a' or 'I' in their names.

Experiment – 10. PL/SQL Programs

1. Program to find sum of first 'n' natural no.s
2. Program to find reverse of number

3. Insert the values of areas of a circle into a table called areas taking radius values from 2 To 8.

Experiment – 11. Cursors

In this week you need to do the following: Declare a cursor that defines a result set. Open the cursor to establish the result set. Fetch the data into local variables as needed from the cursor, one row at a time. Close the cursor when done.

Practice the following programs using cursors.

1. Write a cursor program to retrieve the details of all students using cursors (Use students table in experiment9)
2. Write a PL/SQL block to update the level of students from JL to "junior Level" and SL to "senior Level" and insert a record in new level table.
3. Write a cursor program to display the details of Senior Level students.

Experiment – 12. Procedures

In this session you are going to learn Creation of stored procedure, Execution of procedure and modification of procedure. Practice procedures using the above database.

Eg: CREATE PROCEDURE myProc()
BEGIN
SELECT COUNT(Tickets) FROM Ticket WHERE age>=40;
End;

Experiment – 13. Triggers

In this week you are going to work on Triggers. Creation of insert trigger, delete trigger, update trigger. Practice triggers using the above database.

Eg: **CREATE TRIGGER updcheck BEFORE UPDATE ON**
passenger FOR EACH ROW
BEGIN
IF NEW.TickentNO > 60 THEN
SET New.Tickent no = Ticket no;
ELSESET New.Ticketno = 0;
END
IF;
END;

Text Books:

1. **Introduction to SQL**,Rick F.Vander Lans,Pearsoneducation.
2. **Oracle PL/SQL**, B.Rosenzweig and E.Silvestrova, Pearsoneducation.

Reference Books:

1. **Oracle PL/SQL Programming**, StevenFeuerstein,SPD.
2. **SQL & PL/SQL** for Oracle 10g, Black Book, Dr.P.S.Deshpande,DreamTech.
3. **Oracle Database ll** g PL/SQLProgramming, M.Laughlin.TMH.

Course Outcomes

The students will be able to:

1. Demonstrate, appreciate and effectively explain the underlying concepts of database

technologies.

2. Choose a database schema for a given problem –domain.
3. Demonstrate how to normalize a database.
4. Compute how to query a database using SQL DML/DDL commands.
5. Apply integrity constraints on a database using a state-of-the-art RDBMS.
6. Practice PL/SQL including stored procedures, stored functions, cursors, packages.

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B.Tech. IT	**L**	**T-P-D**	**C**
II Year - I Semester	**0**	**0-3-0**	**2**

(E2121) BASIC ELECTRICAL AND ELECTRONICS LAB

(Common to IT & CSE)

Course Objectives

The students will :

1. Introduce the basic electrical equipments in the lab.
2. Be able to deal with some of the frequently used instruments and equipment; like the digital millimeter and DC Power supply.
3. Understand the nature and scope of modern electronics.
4. Describe physical models of basic components.
5. Design and construct simple electronic circuits to accomplish a specific function, e.g., designing diodes and amplifiers, etc.
6. Understand their capabilities and limitations and make decisions regarding their best utilization in a specific situation.

PART-A

EXPERIMENT I: Verification of KVL &KCL

EXPERIMENT:II Verification of Thevinin's & Norton's Theorem

EXPERIMENT:III Verification of Maximum power transfer theorem .Verification of DC & AC excitation with resistive & reactive loads.

EXPERIMENT:IV Verification of superposition theorem & RMS value of complex wave

EXPERIMENT:V Verification of compensation theorem

EXPERIMENT:VI Verification of reciprocity & millman's theorem

EXPERIMENT:VII Series & parallel resonance - Timming, Resonant frequency, Bandwidth and Q-factor determination for RLC network

PART-B

EXPERIMENT:I PN Junction diode characteristics kit

EXPERIMENT:II Zener diode characteristics kit

EXPERIMENT:III Half wave rectifier with and without filters kit

EXPERIMENT:IV Full wave rectifier with and without filters kit

EXPERIMENT:V CE Characteristics kit

EXPERIMENT:VI CB Characteristics kit

EXPERIMENT:VII CE Amplifier

Course Outcomes

The students will be able to:

1. Do linear modeling of passive elements and sources, and explain the conversion.
2. Use analytical techniques in resistive circuits energized by direct current voltage and current sources applied in theorems.
3. Combine the lecture and laboratory sessions provides learning opportunities that should enable the student to do the following upon completion of this course.
4. Set a bias point in a transistor.
5. Verify the working of diodes, transistors and their applications.
6. Build a common emitter/base/collector amplifier and measure its voltage gain.
7. Understand the use of RPS and CRO.

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B.Tech. IT	**L**	**T-P-D**	**C**
II Year - I Semester	**0**	**0-2-0**	**0**

(E2122) GENDER SENSITIZATION

(Common to all branches)

Course Objectives

The students will :

1. Understand Caste System.
2. Learn women's work its politics and economics them aware rebuilding lives.
3. Understand about relationships, responsibilities and gender identities.

Unit-I

Gender: Why should we study it?, Socialization: Making women, Making Men, Introduction, Preparing For Womanhood, Growing up male, First lessons in caste, Different masculinities.

Unit-II

Women's Work: Its Politics and Economics,

Fact and fiction, Unrecognized and unaccounted work, Further reading: Wages and conditions of work, Domestic Violence: Speaking Out, Is home a safe place?, When women unite [Film], Rebuilding lives, Further reading: New forums for justice.

Unit-III

Just Relationships: Being Together as Equals,

Mary kom and Onler, Love and acid just do not mix, Love letters, Mothers and fathers, Further Reading: Rosa Parks – The brave heart.

Text Books:

1. Towards a world of equals by A.Suneetha SusicTharu publication Telugu academy Hyderabad

Course Outcomes

The students will be able to:

1. Describes the basic structure of Caste system in India and the major four categories to which all castes could be Come out of ignorance and archaic indoctrination to make the world a better place for both men and women.
2. Have learnt to keep them safe and alive in the face of domestic violence.
3. Learnt to maintain equality in gender. The student should have understood the responsibility of being good citizens overcoming social evils.
4. Describes the basic structure of Caste system in India and the major four categories to which all castes could be.

J.B. INSTITUTE OF ENGINEERING &TECHNOLOGY
UGC AUTONOMOUS

B.Tech. IT	**L**	**T-P-D**	**C**
II Year II- Semester	**3**	**0-0-0**	**3**

(E220A) MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

(Common to ECE,EEE,CSE,IT & ECM)

Course Objectives

The students will :

1. Apply the knowledge of demand, demand elasticity & demand forecasting by using statistical techniques for any hypothetical enterprise.
2. Assess the cost behavior, costs useful for managerial decision making and determine Break Even Point (BEP) of an enterprise.
3. Differentiate & distinguish price and output decisions in different market structures i.e., perfect, monopoly, monopolistic & Oligopoly competition.
4. Know the meaning, importance, steps, methods, uses & limitations of Capital Budgeting Analysis and rank various projects under Pay Back, ARR, NPV, PI & IRR methods.
5. Identify & explain the process & principles of accounting and to maintain Journal, Ledger, Trial Balance, Manufacturing A/c, Trading A/c., Profit & Loss A/c. and Balance Sheet of any business undertaking.

Unit I

Introduction & Demand Analysis: Definition, Nature and Scope of Managerial Economics. Demand Analysis: Demand Determinants, Law of Demand and its exceptions. Elasticity of Demand: Definition, Types, Measurement and Significance of Elasticity of Demand. Demand Forecasting, Factors governing demand forecasting, methods of demand forecasting.

Unit II

Production & Cost Analysis: Production Function - Isoquants and Isocosts, MRTS, Least Cost Combination of Inputs, Cobb-Douglas Production function, Laws of Returns, Internal and External Economies of Scale. Cost Analysis: Cost concepts. Break-even Analysis (BEA)- Determination of Break-Even Point (simple problems) - Managerial Significance.

Unit III

Markets & New Economic Environment: Types of competition and Markets, Features of Perfect competition, Monopoly and Monopolistic Competition. Price-Output Determination in case of Perfect Competition and Monopoly. Pricing: Objectives and Policies of Pricing. Methods of Pricing. Business: Features and evaluation of different forms of Business Organization: Sole Proprietorship, Partnership, Joint Stock Company, Public Enterprises and their types, New Economic Environment: Changing Business Environment in Post-liberalization scenario.

Unit IV

Capital Budgeting: Capital and its significance, Types of Capital, Estimation of Fixed and Working capital requirements, Methods and sources of raising capital - Capital Budgeting: features of capital budgeting proposals, Methods of Capital Budgeting: Payback Method, Accounting Rate of return (ARR) and Net Present Value Method -IRR(simple problems).

Unit V

Introduction to Financial Accounting & Financial Analysis: Accounting concepts and Conventions - Introduction IFRS - Double - Entry Book Keeping, Journal, Ledger, Trial Balance - Final Accounts (Trading Account, Profit and Loss Account and Balance Sheet with simple adjustments). Financial Analysis: Analysis and Interpretation of Liquidity Ratios, Activity Ratios, and Capital structure Ratios and Profitability ratios. Du Pont Chart analysis.

TEXT BOOKS:

1. Varshney & Maheswari: Managerial Economics, Sultan Chand,2014.
2. S.A. Siddiqui & A.S. Siddiqui, Managerial Economics and Financial Analysis, New Age international Publishers, Hyderabad2014.
3. M. Kasi Reddy & Saraswathi, Managerial Economics and Financial Analysis, PHI New Delhi,2014.

REFERENCES:

1. Ambrish Gupta, Financial Accounting for Management, Pearson Education, New Delhi, 2012.
2. H. Craig Peterson & W. Cris Lewis, Managerial Economics, Pearson,2012.
3. Lipsey & Chrystel, Economics, Oxford University Press,2012.

Course Outcomes

The students will be able to:

1. Predict the demand for a product or product mix of a company & to analyze various factors influencing demand elasticity.
2. Examine optimum production & cost functions with the help of mathematical equations & by developing graphical solutions through linear programming applications.
3. List features, steps, merits, uses & limitations of Pay Back, ARR, NPV, PI & IRR methods of Capital Budgeting and compute rank of the projects.
4. Discuss the process & principles of accounting and prepare Journal, Ledger, Trial Balance, Manufacturing A/c, Trading A/c., Profit & Loss A/c. and Balance Sheet of an enterprise.

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B.Tech. IT	**L**	**T-P-D**	**C**
II Year - II Semester	**4**	**1-0-0**	**4**

(E226A) OPERATING SYSTEMS

(Common to IT &CSE)

Course Objectives

The students will :

1. Explain the purpose and Different types of operating Systems.
2. Describe process management and CPU Scheduling algorithms.
3. Understand file and directory structures.
4. Understand deadlock prevention and avoidance
5. Explain various memory management and page replacement algorithms.
6. Discuss how files are stored in secondary storage.

UNIT - I:

Operating System Overview

Overview of Computer Operating Systems, Operating System Functions, Protection and Security, Distributed Systems, Special Purpose Systems, Operating System Structures, Operating System Services and Systems Calls, Operating Systems Generation.

Process Management: Process Concepts, Threads, Scheduling-Criteria, Algorithms Evaluation, Thread Scheduling.

UNIT - II:

Concurrency

Process Synchronization, Critical-Section Problem, Peterson's Solution, Synchronization Hardware, Semaphores, Classic Problems of Synchronization, Monitors, Synchronization examples, Atomic Transactions.

Memory Management

Swapping, Contiguous Memory Allocation, Paging, Page-Table Structure, Segmentation, Virtual Memory, Demand Paging, Page-Replacement Algorithms, Frames Allocation, Thrashing.

UNIT - III:

Principles of Deadlock

System Model, Deadlock Characterization, Deadlock Prevention, Detection and Avoidance, Recovery from Deadlock. File System Interface, File Concepts, Access Methods and Directory Structure, File System Mounting, File Sharing and Protection.

UNIT - IV:

File System Implementation

File System Structure, File System Implementation, Directory Implementation, Allocation Methods, Free-Space Management, Efficiency and Performance. Case Studies: UNIX, Linux and Windows.

Mass Storage Overview

Mass-Storage Structure, Disk Structure, Disk Attachment, Disk Scheduling, Swap-Space Management, RAID Structure, Stable-Storage Implementation, Tertiary Storage Structure.

UNIT - V:

Protection

Goals of Protection, Principles of Protection, Domain of Protection Access Matrix, Implementation of Access Matrix, Access Control, Revocation of Access Rights, Capability-Based Systems, Language-Based Protection.

Security

Security Problem, Program Threats, System and Network Threats Cryptography as a Security Tool, User Authentication, Implementing Security Defenses, Firewalling to protect Systems and Networks, Computer-Security Classifications, Case Studies: UNIX, Linux and Windows.

Advanced Operating Systems

Distributed Operating Systems, Multi-Processor Operating Systems, Real-Time Operating Systems and Mobile Operating Systems.

TEXT BOOKS:

1. **Operating System Concepts-Abraham Silberchatz**, Peter B. Galvin, Greg Gagne, 7thEdition, John Wiley.
2. **Operating Systems- A Concept based Approach**-D.M.Dhamdhere, 2nd Edition,TMH.

REFERENCE BOOKS:

1. **Principles of Operating Systems-Naresh Chauhan,** Oxford HigherEducation.
2. **Operating System A Design Approach**-Crowley,TMH.
3. **Modern Operating Systems**-Andrew S Tanenbaum, 2nd Edition Pearson,PHI.

Course Outcomes

The students will be able to:

1. Demonstrate the different operating Systems.
2. Apply different CPU scheduling algorithms.
3. Analyze different directory structures.
4. Use deadlock prevention and avoidance Algorithms.
5. Illustrates the behavior of semaphores and monitors.

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B.Tech. IT	**L**	**T-P-D**	**C**
II Year II- Semester	**4**	**1-0-0**	**4**

(E226B) OBJECT ORIENTED PROGRAMMING THROUGH JAVA
(Common to IT & CSE)

Course Objectives

The students will :

1. Describe with constructors and string handling functions.
2. Explain Inheritance and Polymorphism.
3. Discuss Packages and Interfaces.
4. Discuss Exception handling and Multithreading.
5. Review Applet Programming, Event Handling and scripting.

UNIT – I

Introduction: OOP concepts, history of Java, Java buzzwords, data types, variables, scope and life time of variables, arrays, operators, expressions, control statements, type conversion and casting, simple java program.

Classes and Objects: concepts of classes, objects, constructors, methods, this keyword, garbage collection, overloading methods and constructors, parameter passing, recursion.

String handling: String, String Buffer, String Tokenizer.

UNIT – II

Inheritance: base class object, subclass, member access rules, super uses, using final with inheritance, method overriding, abstract classes

Interfaces: defining an interface, implementing interface, differences between classes and interfaces and extending interfaces.

Packages: Defining, creating and accessing a package, importing packages, access control, exploring package - java.io

UNIT – III

Exception handling: concepts of exception handling, benefits of exception handling, exception hierarchy, checked and unchecked exceptions, usage of-try, catch, throw, throws and finally, built in exceptions, creating own exception sub classes.

Multithreading: differences between multi-threading and multitasking, thread life cycle, creating threads, synchronizing threads, daemon threads, thread groups.

UNIT – IV

Applets: concepts of applets, differences between applets and applications, life cycle of applet, types of applets, creating applets, passing parameters to applets.

Event Handling: events, event sources, event classes, event listeners, delegation event model, handling mouse and key board events, adapter classes. The AWT class hierarchy, user interface components-labels, buttons, canvas, scrollbars, text components, checkbox, checkbox groups, choices, lists

UNIT – V

Layout manager: layout manager types-border, grid, flow, card and grid bag.

Swing: Introduction, limitations of AWT, components, containers, exploring swing- Applet, Frame and Component, Icons and Labels, Text fields, buttons – The Button class, Checkboxes, Radio buttons, Combo boxes, Tabbed Panes, Scroll Panes, Trees and Tables.

TEXT BOOKS:

1. Java The complete reference, 8th editon, Herbert Schildt,TMH.
2. Understanding OOP with Java, up dated edition, T.Budd, Pears oneducation.

REFERENCE BOOKS :

1. An Introduction to programming and OO design using Java, J. Nino and F.A.Hosch, John Wiley &sons.
2. An Introduction to OOP, second edition, T. Budd, pearson education.
3. Introduction to Java programming 6th edition, Y. Daniel Liang, pearson education

Course Outcomes

The students will be able to:

1. Apply constructors and string Handling.
2. Demonstrate Inheritance and Polymorphism.
3. Demonstrate Packages and Interfaces.
4. Choose Exception handling and Multithreading.
5. Practice applet Programming Solve Event Handling.

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B.Tech. IT	**L**	**T-P-D**	**C**
II Year - II Semester	**3**	**0-0-0**	**3**

(E225A) DESIGN AND ANALYSIS OF ALGORITHMS
(Common to IT,CSE &ECM)

Course Objectives
The students will :

1. Explain about on time and space complexity and learning asymptotic notations.
2. Understand union and find algorithms, connected components and bi-connected components.
3. Describe divide and conquer methods.
4. Discuss greedy method and dynamic programming.
5. Understand the back tracking and can applications.
6. Understand branch and bound, P, NP, NP-hand and NP-complete class of problems.

UNIT - I:

Introduction

Algorithm, Pseudo Code for expressing Algorithms, Performance Analysis: Space Complexity, Time Complexity, asymptotic Notations: Big-oh Notation, Omega Notation, Theta Notation, Little-oh Notation. Disjoint Sets: Disjoint Set Operations, Union and Find Algorithms, Spanning Trees, Connected Components and Disconnected Components.

UNIT - II:

Divide and Conquer

General Method, Applications: Binary Search, Quick Sort, Merge Sort, Stassen's Matrix Multiplication.

Greedy Method

General Method Applications: Job Sequencing with Deadlines, 0/1 Knapsack Problem, Minimum Cost Spanning Trees: Prim's and Kruskal's Algorithms, Single Source Shortest Path Problem, Huffman Codes.

UNIT - III:

Dynamic Programming

General Method, Principle of Optimality, Applications: Multistage Graphs, Matrix Chain Multiplication, Optimal Binary Search Trees, 0/1 Knapsack Problem, All Pairs Shortest Path Problem, Travelling Sales Person Problem, Reliability Design.

UNIT - IV:

Backtracking

General Method, Applications: Nqueen Problem, Recursive Permutation Generator, Sum of Subsets Problem, Graph Coloring, Hamiltonian Cycles.

UNIT - V:

Branch and Bound

General Method, Applications: Travelling Sales Person Problem, 0/1 Knapsack Problem, LC Branch and Bound Solution, FIFO Branch and Bound Solution. NP-Hard and NP-Complete Problems: Basic Concepts, Non-Deterministic Algorithms, NP-Hard and NP-Complete Classes, Cook's Theorem.

TEXT BOOKS:

1. **Fundamentals of Computer Algorithms**-Ellis Horowitz, Satraj Sahni and Rajasekharam, Galgotia Publications Pvt.Ltd.
2. **Introduction to Algorithms**-T.H.Cormen, C.E.Leiserso, R.L.Rivest and C.Stein, 2nd Edition, Pearson Education, PHI Pvt.Ltd.

REFERENCE BOOKS:

1. **Algorithm Design: Foundations**, Analysis and Internet Examples-M.T.Goodrich and R.Tomassia, John Wiley andSons.
2. **Introduction to Design and Analysis** of Algorithms A strategic Approach-R.C.T.Lee, S.S.Tseng, R.C.Chang and T.Tsai, Mc-GrawHill.
3. **Design and analysis of Algorithms**-S. Sridhar, Oxford Higher Education.

Course Outcomes

The students will be able to:

1. Apply knowledge on time complexity and space complexity and learn asymptotic notations such as big oh, omega, and theta notations.
2. Apply union and find algorithms, connected components and bi-connected components.
3. Demonstrate divide and conquer method and can apply this to solve some sorting and searching problems.
4. Apply greedy method and dynamic programming can apply these to solve verity of problems.
5. Show knowledge on back tracking and can apply this to solve n-queens problem, sum of subsets problem, graph coloring problem and Hamiltonian cycles problems.
6. Apply knowledge on branch and bound can apply this to solve TSP and 0/1 knapsack problem. Gain knowledge on P, NP, NP-hand and NP-complete class of problems.

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B.Tech. IT	**L**	**T-P-D**	**C**
II Year - II Semester	**4**	**1-0-0**	**4**

(E225B) COMPUTER NETWORKS

(Common to IT & CSE)

Course Objectives

The students will :

1. Describe the terminology and concepts of the OSI and TCP-IP reference model.
2. Identify various error correction and error detection methods.
3. Select addressing mechanisms efficiently to build a network.
4. Understand and predict the Pros and cons of existing protocols and its working.

UNIT - I:

Overview of the Internet: Protocol, Layering Scenario, TCP/IP Protocol Suite: The OSI Model, Internet history standards and administration; Comparison of the OSI and TCP/IP reference model.

Physical Layer: Guided transmission media, wireless transmission media.

Data Link Layer - design issues, CRC codes, Elementary Data Link Layer Protocols, sliding window protocol.

UNIT - II:

Multi Access Protocols - ALOHA, CSMA, Collision free protocols, Ethernet- Physical Layer, Ethernet Mac Sub layer, data link layer switching & use of bridges, learning bridges, spanning tree bridges, repeaters, hubs, bridges, switches, routers and gateways.

UNIT - III:

Network Layer: Network Layer Design issues, store and forward packet switching connection less and connection oriented networks-routing algorithms-optimality principle, shortest path, flooding, Distance Vector Routing, Control to Infinity Problem, Hierarchical Routing, Congestion control algorithms, admission control.

UNIT - IV:

Internetworking: Tunneling, Internetwork Routing, Packet fragmentation, IPv4, IPv6 Protocol, IP addresses, CIDR, IMCP, ARP, RARP, DHCP.

Transport Layer: Services provided to the upper layers elements of transport protocol-addressing connection establishment, connection release, Connection Release, Crash Recovery.

UNIT - V:

Transport Layer UDP-RPC, Real Time Transport Protocols, The Internet Transport Protocols-Introduction to TCP, The TCP Service Model, The TCP Segment Header, The Connection Establishment, The TCP Connection Release, The TCP Connection Management Modeling, The TCP Sliding Window, The TCP Congestion Control, The future of TCP.

Application Layer- Introduction, providing services, Applications layer paradigms, Client server model, Standard client-server application-HTTP, FTP, electronic mail, TELNET, DNS, SSH

Text books:

1. Data Communications and Networking - Behrouz A. Forouzan, Fifth Edition TMH,2013.
2. Computer Networks - Andrew S Tanenbaum, 4th Edition, Pearson Education.

References books:

1. An Engineering Approach to Computer Networks - S. Keshav, 2nd Edition, Pearson Education.
2. Understanding communications and Networks, 3rd Edition, W. A. Shay, Cengage Learning.
3. Introduction to Computer Networks and Cyber Security, Chwan-Hwa (John) Wu, J.David Irwin, CRC Press.

Course Outcomes

The students will be able to:

1. Apply the different types of network topologies and protocols.
2. Illustrate the layers of the OSI model and TCP/IP.
3. Choose the different types of network devices and their functions within a network.
4. Apply all the error correction and detection mechanisms.
5. Demonstrate the skills of sub netting and routing techniques.
6. Illustrate the addressing mechanisms to assign IP addresses to the network efficiently.

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UGC AUTONOMOUS

B.Tech.IT	**L**	**T-P-D**	**C**
II Year -II Semester	**0**	**0-3-0**	**2**

(E2218) OPERATING SYSTEMS LAB

(Common to IT & CSE)

Course Objectives

The students will :

1. Describe CPU Scheduling algorithms.
2. Understand the file allocation and file organization strategies
3. Understand Banker's Algorithm for deadlock prevention and avoidance
4. Explain various memory management and page replacement algorithms.
5. Discuss Paging and allocation of frames
6. Distinguish different Disk Scheduling Algorithms

EXPERIMENT 1: Simulate the following CPU scheduling algorithms
a) Round Robin b) SJF.

EXPERIMENT 2: Simulate the following CPU Scheduling algorithms
a) FCFS b) Priority.

EXPERIMENT 3: Simulate all file allocation strategies.
a) Sequential b) Indexed c) Linked.

EXPERIMENT 4: Simulate MVT and MFT.

EXPERIMENT 5: Simulate the following File Organization Techniques
a) Single level directory b) Two level.

EXPERIMENT 6: Simulate the following File Organization Techniques
a) Hierarchical b) DAG.

EXPERIMENT 7: Simulate Disk scheduling algorithms
a) FCFS b) SSTF c) SCAN d) C-SCAN e) LOOK.

EXPERIMENT 8: Simulate Bankers Algorithm for Dead Lock Avoidance.

EXPERIMENT 9: Simulate Bankers Algorithm for Dead Lock Prevention.

EXPERIMENT 10: Simulate all page replacement algorithms
a)FIFO b) LRU c) LFU Etc.…

EXPERIMENT 11: Simulate Paging Technique of memory management.

EXPERIMENT 12: Simulate on Allocation of Frames.

Course Outcomes

The students will be able to:

1. Apply different CPU scheduling algorithms.
2. Apply different directory structures.
3. Analyze deadlock prevention and avoidance
4. Write various page replacement Algorithms.
5. Practice disk scheduling algorithms.
6. Illustrate paging and frame allocation.

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B.Tech. IT	**L**	**T-P-D**	**C**
II Year - II Semester	**0**	**0-3-0**	**2**

(E2219) OBJECT ORIENTED PROGRAMMING THROUGH JAVALAB

(Common to IT & CSE)

Course Objectives

The Students will :

1. Discuss how to write Java programs using arithmetic operators ,control statements, type conversion, constructors and string handling
2. Explain how to write Java programs using Inheritance and Polymorphism
3. Explain how to write Java programs for creation of user defined Packages and Interfaces
4. Discuss Exception handling, Multithreading and Event Handling
5. Explain how to write Java programs using Applets

EXPERIMENT 1:

Write java programs that implement the following

a) Constructor b) Parameterized constructor

c) Method overloading d) Constructor overloading.

EXPERIMENT-2:

a) Write a Java program that checks whether a given string is a palindrome or not. Ex: MADAM is a palindrome.

b) Write a Java program for sorting a given list of names in ascendingorder.

c) Write a Java Program that reads a line of integers, and then displays each integer and the sum of all the integers (Use String Tokenizer class of java.util

EXPERIMENT-3:

Write java programs that uses the following keywords

a) this b)super

c)static d) final

EXPERIMENT-4:

a)Write a java program to implement methodoverriding

b)Write a java program to implement dynamic methoddispatch.

c)Write a Java program to implement multipleinheritance.

d)Write a java program that uses accessspecifiers

EXPERIMENT-5:

a) Write a Java program that reads a file name from the user, then displays information about whether the file exists, whether the file is readable, whether the file is writable, the type of file and the length of the file inbytes.

b) Write a Java program that reads a file and displays the file on the screen, with a linenumber before eachline.

c) Write a Java program that displays the number of characters, lines and words in a textfile

EXPERIMENT-6:

a) Write a Java program for handling CheckedExceptions.

b) Write a Java program for handling UncheckedExceptions

EXPERIMENT-7:

a) Write a Java program that creates three threads. First thread displays "Good Morning" every one second, the second thread displays "Hello" every two seconds and the third thread displays "Welcome" every threeseconds.

b)Write a Java program that correctly implements producer consumerproblemusing the c

EXPERIMENT-8:

a) Develop an applet that displays a simplemessage.

b) Develop an applet that receives an integer in one text field, and computes its factorial value and returns it in another text field, when the button named "Compute" isclicked

EXPERIMENT-9:

Write a Java program that works as a simple calculator. Use a grid layout to arrange button for the digits and for the +, -,*, % operations. Add a text field to display theresult

EXPERIMENT-10:

a) Write a Java program for handling mouse events. b) Write a Java program for handling key events.

EXPERIMENT-11:

1. Write a program that creates a user interface to perform integer divisions. The user enters two numbers in the text fields Num1 and Num 2.

The division of Num1 and Num2 is displayed in the Result field when the Divide button is clicked. If Num1or Num2 were not an integer, the program would throw Number Format Exception. If Num2 were Zero, the program would throw an Arithmetic Exception and display the exception in a message dialog box.

EXPERIMENT-12:

a) Writeajavaprogramthatsimulatestrafficlight.Theprogramletstheuserselectoneof three lights: red, yellow or green. When a radio button is selected, the light is turned on, and only one light can be on at a time No l Light is on when the program starts.

b) Write a Java program that allows the user to draw lines, rectangles and ovals

EXPERIMENT-13:

Create a table in Table.txt file such that the first line in the file is the header, and the remaining lines correspond to rows in the table. The elements are separated by commas. Write a java program to display the table using JTable component

TEXT BOOKS:

1. Java;the complete reference,8th editon ,Herbert Schildt,TMH.
2. Java How to Program, Sixth Edition, H.M.Dietel and P.J.Dietel,Pearson Education/PHI.
3. Introduction to Java programming, Sixth edition, Y.Daniel Liang, PearsonEducation.
4. Big Java, 2nd edition, Cay Horstmann, Wiley Student Edition, Wiley India PrivateLimited

Course Outcomes

The Students will be able to:

1. Write Java programs using arithmetic operators ,control statements, type conversion, constructors and string handling
2. Write Java programs for Inheritance and Polymorphism
3. Write Java programs for creation of user defined Packages and Interfaces
4. Write Java programs for Exception handling and Multithreading
5. Write Java programs for creation of Applets
6. Write Java programs for Event Handling

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B.Tech. IT	**L**	**T-P-D**	**C**
II Year - II Semester	**0**	**0-3-0**	**2**

(E2220) COMPUTER NETWORKS LAB

(Common to IT & CSE)

Course Objectives

The Students will :

1. Understand various error correction and detection mechanisms.
2. Identify basic networking algorithms.
3. Distinguish various algorithms to compute the shortest path through a graph
4. Discuss various encryption and decryption algorithms

Course Outcomes

The Students will be able to:

1. Use error correction and error detection mechanisms.
2. Apply shortest path algorithm for sending packets for efficient utilization of bandwidth.
3. Prepare routing table for efficient transmission of packets
4. Apply encryption and decryption algorithms for text data

EXPERIMENT 1:Implement the data link layer farming methods such as character, character stuffing and bit stuffing.

EXPERIMENT 2 :Implement on a data set of characters the three CRC polynomials - CRC 12, CRC 16 and CRC CCIP.

EXPERIMENT 3:Implement Dijkstra's algorithm to compute the shortest path through a graph.

EXPERIMENT 4:Take an example subnet graph with weights indicating delay between nodes. Now obtain Routing table at each node using distance vector routing algorithm.

EXPERIMENT 5:Take an example subnet of hosts. Obtain broadcast tree for it.

EXPERIMENT 6:Take a 64 bit playing text and encrypt the same using DES algorithm.

EXPERIMENT 7:Write a program to break the above DES coding.

EXPERIMENT 8: Using RSA algorithm Encrypt a text data and Decrypt the same.

EXPERIMENT 9: Implementation of Hamming Code.

EXPERIMENT 10: Simulation of Stop and wait protocol

EXPERIMENT 11: Simulation of TCP client and server program

EXPERIMENT 12: Using sniffing tool capture packets and analyze

TEXT BOOKS:

1. Data Communications and Networking - Behrouz A. Forouzan, Fifth Edition TMH,2013.
2. Computer Networks - Andrew S Tanenbaum, 4th Edition, PearsonEducation.

REFERENCES BOOKS:

1. An Engineering Approach to Computer Networks - S. Keshav, 2nd Edition, Pearson Edication.
2. Understanding communications and Networks, 3rd Edition, W. A. Shay, CengageLearning.
3. Introduction to Computer Networks and Cyber Security, Chwan-Hwa (John) Wu, J.David Irwin, CRC Press.

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B.Tech. IT	**L**	**T-P-D**	**C**
III Year - I Semester	**4**	**1-0-0**	**4**

(E315A) PYTHON PROGRAMMING

(Common for CSE, IT)

Course objectives:

Student will:

1. Design and program Python applications.
2. Use lists, tuples, and dictionaries in Python programs.
3. Identify Python object types, Components ,decision statements, pass arguments in Python.
4. Build and package Python modules for reusability, design object oriented programs with Python classes,use class inheritance in Python for reusability.
5. Use exception handling in Python applications for error handling

UNIT - I:

Programming paradigms: Structured programming vs object oriented programming, OOPs fundamentals- class, object, abstraction, encapsulation, polymorphism, and inheritance; Introduction to Python: Getting started to Python- an interpreted high level language, interactive mode and script mode. Variables, Expressions and Statements Values and types, Variables and keywords, statements, evaluating expressions, operators and operands, order of operations, composition.

Functions: function calls, type conversion, type coercion, pre-defined functions, composition, user define functions, flow of execution, passing parameters, function parameters and scope. Conditionals and recursion modulus operator, Boolean expression, logical operators, conditional execution, alternative execution, chained and nested conditionals, return statement; Recursion, infinite recursion.

UNIT - II:

Python data structures: Strings Creating, initializing and accessing the elements; String operators, comparing strings using relational operators; String functions and methods.

Lists: Concept of mutable lists, creating, initializing and accessing the elements, traversing, appending, updating and deleting elements; List operations; List functions and Methods, list parameters, nested lists, Matrices.

Dictionaries

Concept of key-value pair, creating, initializing and accessing the elements in a dictionary, dictionary operations traversing, appending, updating and deleting elements, Dictionary functions and methods.

Tuples: Mutability and tuples, Immutable concept, creating, initializing and accessing the elements in a tuple, Tuple functions.

UNIT - III:

Object oriented programming using Python: creating python classes, classes and objects: user defined compound types, attributes, instances as arguments, instances as return values, objects are mutable, copying; classes and functions: pure function, modifiers;

Exceptions: raising exceptions, handling exceptions, exception hierarchy.

UNIT - IV:

Classes and methods: object oriented features, optional arguments, initialization method, operator overloading and polymorphism.

Inheritance: Basic Inheritance: extending built-ins, overriding and super; Multiple inheritance: the diamond problem, different sets of arguments.

UNIT - V:

Files handling and Exceptions: Text files, writing variables, Directories, Pickling;

Database Programming in Python: Connection module, connect MySQL Data base, perform DDL, DML and DQL operations.

xt Books:

1. **Python 3 Object Oriented Programming,** Dusty Phillips, Packet Publishing, 2010.
2. **Programming in Python 3** - A complete Introduction to the Python Language-Second Edition, Mark Summerfiels, Addison-Wesley 2010.

ference Books:

1. **Programming Python- 4th Edition**, Mark Lutz, O'Reilly, 2011.
2. **Object-Oriented Programming in Python**, Michael H, Goldwasser, David Letscher, Pearson Prentice Hall, 2008.

Course outcomes:

Students will abel to:

1. Explain basic principles of Python programming language
2. Analyze the use of lists, tuples, and dictionaries in Python programs.
3. Implement object oriented concepts in Python, and how to use exception handling in Python applications for error handling.
4. Demonstrates how to achieve reusability using inheritance, interfaces and packages.
5. Explain how to read and write files in Python and evaluate different database operations.

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B.Tech.IT	**L**	**T-P-D**	**C**
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(E316A) OBJECT ORIENTED SOFTWARE ENGINEERING

Course Objectives
The students will

1. Understand software process models such as waterfall and evolutionary models.
2. Identify software requirement specification and document it.
3. Identify an ability to practically apply knowledge software engineering methods, such as object-oriented analysis and design methods with a clear emphasis on UML.
4. Describe a working ability and grasping attitude to design and conduct object-oriented analysis and design experiments using UML, as well as to analyze and evaluate their models.
5. Discuss software testing approaches such as unit testing and integration testing.

Course Outcomes
The Students will be able to:

1. Apply the process of software development lifecycle.
2. Solve practical solutions to the problems.
3. Apply object oriented programs using a selected OOP programming language.
4. Apply object oriented software development techniques from requirements gathering to implementation.
5. Apply Object Oriented Software Development Process.
6. Analyze and design test cases using black box testing technique which includes decision tables domain testing and transition testing.

UNIT –I

Introduction to Software Engineering: The evolving role of Software, changing nature of Software, Software Myths.

Generic view of Process: Software Engineering, Process Framework, The Capability Maturity Model Integration (CMMI), Process Patterns, Process Assessment, Personal and Team Process, Process Technology, Product and process.

Process Models: Waterfall Model, Incremental Process Models, Evolutionary Process Models, The Unified Process.

UNIT-II

Software Requirements: Functional and non-functional requirements, user requirements, system requirements, interface specification, the software requirements document**.**

Requirements engineering process: Feasibility studies, requirements elicitation and analysis, requirements validation, requirements management.

System Models: Context models, behavioral models, data models, object models, structured methods.

Creating an architectural design: Software architecture, data design, architectural styles and patterns, architectural design.

UNIT-III

Design Engineering: Design process and Design quality, design concepts, the design model, data flow diagrams, data dictionaries.

Introduction to UML: Importance of modeling, Principles of modeling, Object oriented modeling, Conceptual model of UML, Architecture.

Basic Structural Modeling: Classes, Relationships, Common Mechanisms, Diagrams, Class diagrams.

Advanced Structural Modeling: Advanced Classes, Advanced Relationships, Interfaces, Types and Roles, Packages, Instances, Object diagrams.

UNIT-IV

Behavioral Modeling: Use Cases, Use case diagrams, Interactions, Interaction diagrams, Activity diagrams.

Advanced Behavioral Modeling: Events and Signals, Time and Space , State machines, Processes and Threads, State Chart diagrams.

Architectural Modeling: Components, Component diagrams, Deployment, Deployment diagrams, Patterns and Frameworks.

UNIT-V

Software Testing Strategies: A strategic approach to software testing, test strategies for conventional software, Black-Box and White-Box testing, validation testing, system testing, the art of debugging.

Product Metrics: Software quality, metrics for analysis model, Metrics for design model, metrics for source code, metrics for testing, metrics for maintenance.

Metrics for Process and Products: Software Measurement, Metrics for software quality

Quality management: Quality concepts, software quality assurance, software reviews, software reliability, the ISO 9000 quality standards.

TEXT BOOK:

1. Roger S.Pressman, “Software Engineering: A Practitioners Approach” ,7th edition, McGrawHill,2009
2. Software testing techniques-Baris Beizer, Dreamtech, 2nd edition
3. The Unified modeling language, User guide by Grady Booch, James Rumbaugh,Ivar Jaccobson

REFERENCE BOOKS:

1. Software engineering, Ian Sommerville, 7th Edition, PearsonEducation
2. Ali Behforoz and Frederic J.Hadson, “Software Engineering Fundamentals”,Oxford Semester-End Press,1996.
3. The craft of software testing- Brian Marick, PearsonEducation

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(E315E) LINUXPROGRAMMING

(Common to CSE,IT)

Course Objectives

The Students will

1. Understand the major components in the LINUX system structure and describe the architecture of the UNIX operating system.
2. Understand the use of UNIX utilities and Shell scripting language such asbash.
3. Gain advanced C systems programming and debugging techniques in a Unix/Linux environment.
4. Understand how to organize and manipulate files and directories in Linux Operating system.
5. Understand how to use UNIX utilities to create simple tools for the information processing for inter process communication consisting of pipes, FIFOs, Semaphores and message Queues
6. Understand Network Programming covering TCP, and UDP connections.

Course Outcomes

The Students will be able to:

1. Work confidently in Linux environment.
2. Write shell script to automate different tasks as Linux administration
3. Use different Linux utilities to organize and manipulate files and directories in Linux Operating system.
4. Schedule the process for inter process communication techniques using various system calls.
5. Operate remote system by connecting to them using socket programming system calls for TCP, and UDP connections.

UNIT - I

Linux Utilities-File handling utilities, Security by file permissions, Process utilities, Disk utilities, Networking commands, Filters, Text processing utilities and Backup utilities, sed – scripts, operation, addresses, commands, applications, awk – execution, fields and records, scripts, operation, patterns, actions, functions, using system commands in awk.

UNIT- II

Working with the Bourne again shell(bash): Introduction, shell responsibilities, pipes and input Redirection, output redirection, here documents, running a shell script, the shell as a programming language, shell meta characters, file name substitution, shell variables, command substitution, shell commands, the environment, quoting, test command, control structures, arithmetic in shell, shell script examples, interrupt processing, functions, debugging shell scripts.

UNIT - III

Files: File Concept, File System Structure, I-nodes, File Attributes, File types, Library functions,

the standard I/O and formatted I/O in C, stream errors, kernel support for files, System calls, file descriptors, low level file access – File structure related system calls(File APIs), file and record locking, file and directory management – Directory file APIs, Symbolic links & hard links. Process – Process concept, Kernel support for process, process attributes, process control - process creation, waiting for a process, process termination, zombie process, orphan process, Process APIs.

UNIT -IV

Signals– Introduction to signals, Signal generation and handling, Kernel support for signals, Signal function, unreliable signals, reliable signals, kill, raise , alarm, pause, abort, sleep functions.

Interprocess Communication: Introduction to IPC, Pipes and FIFOs, Introduction to three types of IPC-message queues, semaphores and shared memory.

Message Queues- Kernel support for messages, UNIX system V APIs for messages, client/server example.

Semaphores-Kernel support for semaphores, UNIX system V APIs for semaphores.

Shared Memory- Kernel support for shared memory, UNIX system V APIs for shared memory, semaphore and shared memory example.

UNIT -V

Multithreaded Programming: Differences between threads and processes, Thread structure and uses, Threads and Lightweight Processes, POSIX Thread APIs, Creating Threads, Thread Attributes, Thread Synchronization with semaphores and with Mutexes, Example programs.

Sockets: Introduction to Sockets, Socket Addresses, Socket system calls for connection oriented protocol and connectionless protocol, example-client/server programs.

TEXT BOOKS:

1. Unix Concepts and Applications, 4th Edition, Sumitabha Das,TMH
2. Unix System Programming using C++, T.Chan, PHI.(UNIT III to UNITVIII)

REFERENCE BOOKS:

1. Beginning Linux Programming, 4th Edition, N.Matthew, R.Stones,Wrox, Wiley India Edition.
2. Linux System Programming, Robert Love, O'Reilly,SPD.
   Advanced Programming in the Unix environment, 2nd Edition, W.R.Stevens, Pearson Education.

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(E310B) MANAGEMENT SCIENCE
(Common toCSE,IT,ECE,EEE,ECM)

Course Objectives
The Students will :

1. This course is intended to familiarize the students with the framework for the managers and leaders available for understanding and making decisions relating to issues related organizational structure, production operations, marketing, Human resource Management, product management and strategy

Course Outcomes
The Students will be able to:

1. Planning an organizational structure for a given context in the organization carryout production operations through Work-study.
2. Carry out production operations through Work-study.
3. Understand the markets, customers and competition better and price the given products appropriately.
4. Ensure quality for a given product or service.
5. Plan and control the HR function better.
6. Plan, schedule and control projects through PERT and CPM.
7. Evolve a strategy for a business or service organization.

UNIT I

Introduction to Management: Types of Business, Nature and Importance of Management, Functions of Management, Taylor's Scientific Management Theory, Fayol's Principles of Management, Douglas McGregor's Theory X and Theory Y, Systems Approach to Management. 7's frame work, Contingency theory, Ethics and corporate social responsibilities

UNIT II

Planning & Organizational Structures: Types of planning, nature of planning, level of planning, planning process, Vision, mission, objectives of organization,
Departmentation, Decentralisation centralization and Recentralization. Types of Organisation structures - Line organization, Line and staff organization, functional organization, Committee organization, Matrix organization, Cellular Organisation, Virtual Organization, Team structure, lean and flat organization structure and their merits, demerits and suitability

UNIT III

Operations Management: Types of Plant Layout-Methods of production Job, batch and Mass Production), Work Study -Basic procedure involved in Method Study and Work Measurement-
Statistical Quality Control: $\overline{X}$ chart, R chart, c chart, p chart, Quality, Deming principles, EOQ, ABC Analysis, VED Analysis. TQM, JIT, BPR, Six Sigma.
Project Management (PERT/CPM): Programme Evaluation and Review Technique (PERT),

Critical Path Method (CPM), identifying critical path,.

UNIT IV

Human Resources Management (HRM): Concepts of HRM, Basic functions of HR Manager: Manpower planning, Recruitment, Selection, Training and Development, Placement, Promotion, Performance Appraisal, Grievance Handling and Welfare Administration, Job Evaluation and Merit Rating, Bench marking, Compensation, Leadership, Leadership styles, Motivation, Groups &Teams

UNIT V

Marketing: Functions of Marketing, Marketing Mix, Marketing Strategies based on Product Life Cycle., Channels of distribution. Retailing and Basics of Rural Marketing, Digital Marketing, Virtual Marketing, Supply chain management.

REFERENCE BOOKS:

1. Aryasri: *Management Science*, TMH, New Delhi,2009
2. Stoner, Management, Pearson,2009
3. Kotler Philip & Keller Kevin Lane: Marketing Management PHI,2009.
4. Koontz, Weihrich, & Aryasri: Principles *of Management*, TMH,2009.
5. Thomas N.Duening & John M.Ivancevich *Management—Principles andGuidelines,* Cengage, 2009.
6. Kanishka Bedi, *Production and Operations Management*, Oxford University Press,2009.
7. Memoria & S.V.Ganker, *Personnel Management*, Himalaya,2009
8. Schermerhorn: *Management*, Wiley,2009.
9. Parnell: Strategic Management, Biztantra,2009.
10. L.S.Srinath: PERT/CPM,Affiliated East-West Press,2009.
11. William J. Stevenson & Ceyhun Ozgur: Introduction to Management Science, TMH,2007.
12. P.Subba Rao : Human ResourceManagement.
13. Ramaswamy Namakumari: MarketingManagement.

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(E3116) PYTHONPROGRAMMIN GLAB

(Common for CSE&IT)

Course Objectives
The Students will :

1. To implement Basic input /output operations with various Data Types supported by python.
2. To develop functions for code reusability and experiment string manipulation operations with the use of inbuilt functions.
3. To Create a python program for experimenting list, tuple and dictionary
4. To demonstrate Class and objects to make use of object oriented programming concepts.
5. To Implement File handling operations to access the contents offile.

Course Outcomes
The Students will be able to:

1. Apply Basic input /output operations for working with different data types in python.
2. Design functions for achieving code reusability and string manipulations.
3. Create a python program for list, tuple dictionary
4. Demonstrate Class and objects
5. Implement File handling operations

EXPERIMENT 1

i. Write a python program to obtain user input data (int, float, string) and display.
ii. Write a python program to find the roots of a quadratic equation
iii. Write a python program to perform arithmetic operations (+, -, *, /, %) for given input values and printout the result values.

EXPERIMENT 2.

i. Write a python programs that use both recursive and non-recursive functions to find the factorial of a given integer
ii. Operators and Operands in Python: (Arithmetic, relational and logical operators), operator precedence, Expressions and Statements.
iii. (Assignment statement); Taking input (using raw input () and input ()) and displaying output (print statement); Putting Comments.

EXPERIMENT 3.

i. Write python programs to perform operation on Strings using following functions: len, capitalize, find, isalnum, isalpha, isdigit, lower, islower, isupper, upper, lstrip, rstrip, isspace, istitile, partition, replace, join, split, count, decode, encode,swapcase.
ii. Enter the details of 5 students and display the detailssequentially.

EXPERIMENT 4.

i. Write python programs to perform List operators: (joining, list slices)
ii. Write python programs to perform List functions: len, insert, append, extend, sort, remove, and reverse, pop.
iii. Write python programs to check whether the string is palindrome or not?

EXPERIMENT 5.

i. Write python programs to perform Tuple functions: cmp(), len(), max(), min(),tuple()
ii. Write python programs to check whether the word is present in the tuple ornot?
iii. Write python programs to Takea string as ("1234567890") and create apair {(1,2),(3,4),(5,6),(7,8),(9,0)} using tuple.

EXPERIMENT 6.

i. Write python programs to perform Dictionary functions & Methods: cmp, len, clear(), get(), has_key(), items(), keys(), update(), values().
ii. Write python programs to Create a list of animal using dictionary variable "animal" and find out if the specific animal present in the list or not?

EXPERIMENT 7.

i) Write a python program to create a class, its objects and accessing attributes.
ii) Create a Customer class and check the balance and withdraw and deposit some amount.

EXPERIMENT 8. Write a python script to implement exception handling.

i. Check whether the input no is integer or not.
ii. Handel the exceptions that are come at the time of division.

EXPERIMENT 9. Write a python script to perform inheritance.

EXPERIMENT 10. Write a python script to perform various FILE handling operations. Open, close, read, write, copy.

EXPERIMENT 11.

i) Write a python script to connect to the database and perform DDL operations.
ii) Create table, insert data into table and display the table data.

EXPERIMENT12. Write a python script to connect to the database and perform various DML and DQL operations.

Text Books:

1. **Programming in Python 3**- A complete Introduction to the Python Language- Second Edition, Mark Summerfiels, Addison-Wesley2010.
2. **Programming Python**- 4th Edition, Mark Lutz, O'Reilly,2011.

Reference Books:

1. **Object-Oriented Programming in Python**, Michael H, Goldwasser, David Letscher, Pearson Prentice Hall, 2008

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(E3117) OBJECT ORIENTED SOFTWARE ENGINEERING LAB

Course Objectives
The Students will :

1. Familiarize students with software development process.
2. Describe a problem statement.
3. Demonstrate standard SRS document.
4. Discuss various UML diagrams.
5. Identify test cases using black box testing technique which includes decision tables domain testing and transition testing.

Course Outcomes
The Students will be able to:

1. Apply software development process.
2. Demonstrate the problem statement.
3. Illustrate the SRS document.
4. Apply various UML diagrams.
5. Analyze and design test cases using unit and integrated testing technique.

EXPERIMENT – I:
Write down the problem statement for a suggested system of relevance

EXPERIMENT- II:
Do requirement analysis and develop software requirement specification sheet (SRS) for any system

EXPERIMENT-III:
Develop DFD model (Level 0, Level 1 DFD and data dictionary) of the sample problem.

EXPERIMENT-IV:
Develop structured design for the DFD model.

EXPERIMENT- V:
To draw the structural view diagrams for the system:
a) Class diagram b) Object diagram

EXPERIMENT-VI:
To perform the user's view analysis for any suggested system: Use case diagram

EXPERIMENT-VII:
To perform the behavioral view diagrams for the suggested system:
a) Sequence diagram b) Collaborationdiagram

EXPERIMENT-VIII:

To draw the behavioral view diagram:

a) State chart diagram b) Activity diagram

EXPERIMENT-IX

To perform the implementation and environmental view diagram:

a) Component diagram for the system b) Deployment diagram for the system

EXPERIMENT-X

Write a program in "C" language for matrix multiplication fails. Introspect the causes for its failure and write down the possible reasons for its failure

EXPERIMENT – XI

Write the test cases for any application

EXPERIMENT – XII

Using Selenium IDE, Write a test suite containing minimum 4 test cases

TEXT BOOK:

1. Software Testing Tools – Dr.K.V.K.K.Prasad, Dreamtech.
2. The Unified modeling language, User guide by Grady Booch, James Rumbaugh, Ivar Jaccobson

REFERENCE BOOKS:

1. The craft of software testing - Brian Marick, Pearson Education.
2. Software Testing Techniques –SPD(Oreille)
3. Software Testing in the Real World – Edward Kit,Pearson.

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(E3118) LINUX PROGRAMMING LAB

Course Objectives
The Students will :

1. Understand the Linux environment.
2. Understand how to write shell scripting/programming
3. Apply the various Linux system calls for writing c programs to implement inter-process communication

Course Outcomes
The Students will be able to:

1. Develop application programs using commands and system calls in Unix.
2. Make effective use of UNIX utilities, and scripting languages
3. Implement inter-process communication between processes.
4. Configure and manage simple TCP/IP network services on a Linux system

Note: Use Bash for Shell scripts.

EXPERIMENT 1. Write a shell script that accepts a file name, starting and ending line numbers as arguments and displays all the lines between the given line numbers.

EXPERIMENT 2. Write a shell script that deletes all lines containing a specified word in one or more files supplied as arguments to it.

EXPERIMENT 3. Write a shell script that displays a list of all the files in the current directory to which the user has read, write and execute permissions.

EXPERIMENT 4. Write a shell script that receives any number of file names as arguments checks if every argument supplied is a file or a directory and reports accordingly. Whenever the argument is a file, the number of lines on it is also reported.

EXPERIMENT 5. Write a shell script that accepts a list of file names as its arguments, counts and reports the occurrence of each word that is present in the first argument file on other argument files.

EXPERIMENT 6. Write a shell script to list all of the directory files in a directory.

EXPERIMENT 7. Write a shell script to find factorial of a given integer.

EXPERIMENT 8. Write an awk script to count the number of lines in a file that do not contain vowels.

EXPERIMENT 9. Write an awk script to find the number of characters, words and lines in a file.

EXPERIMENT 10. Write a c program that makes a copy of a file using standard I/O and system calls.

EXPERIMENT 11. Implement in C the following Unix commands using System calls

A.cat B.ls C.mv

EXPERIMENT 12. Write a program that takes one or more file/directory names as command line input and reports the following information on the file.

A.File type. B. Number of links.

C. Time oflastaccess. D. Read, Write and Execute permissions.

EXPERIMENT 13. Write a C program to emulate the Unix ls –command.

EXPERIMENT 14. Write a C program to list for every file in a directory, its inode number and file name.

EXPERIMENT 15. Write a C program that demonstrates redirection of standard output to a file.Ex: ls > f1.

EXPERIMENT 16. Write a C program to create a child process and allow the parent to display "parent" and the child to display "child" on the screen.

EXPERIMENT 17. Write a C program to create a Zombie process.

EXPERIMENT 18. Write a C program that illustrates how an orphan is created.

EXPERIMENT 19. Write a C program that illustrates how to execute two commands concurrently with a command pipe. Ex:- ls –l |sort

EXPERIMENT20. Write C programs that illustrate communication between two unrelated processes using named pipe.

EXPERIMENT 21. Write a C program to create a message queue with read and write permissions to write 3 messages to it with different priority numbers.

EXPERIMENT 22. Write a C program that receives the messages (from the above message queue as specified in (21)) and displays them.

EXPERIMENT 23. Write a C program to allow cooperating processes to lock a resource for exclusive use, using a) Semaphores b) flock or lock system calls.

EXPERIMENT 24. Write a C program that illustrates suspending and resuming processes using signals.

EXPERIMENT 25. Write a C program that implements a producer-consumer system with two processes. (Using Semaphores).

EXPERIMENT 26. Write client and server programs(using c) for interaction between server and client processes using Unix Domain sockets.

EXPERIMENT 27. Write client and server programs(using c) for interaction between server and client processes using Internet Domain sockets.

EXPERIMENT 28. Write a C program that illustrates two processes communicating using shared memory.

TEXT BOOKS:

1. Advanced Unix Programming, N.B.Venkateswarulu, BSPublications.
2. Unix and Shell programming, B.A.Forouzan and R.F.Gilberg, CengageLearning
3. Unix and Shell Programming, M.G. Venkatesh Murthy, Pearson Education,2005.
4. Unix Shells by Example, 4th Edition, Elllie Quigley, Pearson Education.
   Sed and Awk, O.Dougherty&A.Robbins,2nd edition,SPD.

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(E325F) WEB TECHNOLOGIES

(Common to CSE,IT)

Course Objectives

The Students will :

1. Get best technologies for solving web client/server problems
2. Solve and Use JavaScript for dynamic effects and form input entry
3. Recognize appropriate client-side or Server-side applications
4. Receive ability to adapt to changing Web development and design skills and solid understanding of common design trends.
5. provide web application development software tools i.e. Ajax, PHP and XML etc. and identify the environments currently available on the market to design websites
6. Install a web server application and Deploy Java Applets and Servlets

Course Outcomes

The Students will be able to:

1. Students will Analyze and able to develop a dynamic webpage by the use of java script
2. StudentscansolvetowriteaserversidejavaapplicationcalledJSPtocatchformdata sent from client, process it and store it on database.
3. Recognize a good grounding of web application terminologies, internet tools, other web services.
4. Conduct modern protocols and systems used on the Web (such as HTML, HTTP,URLs, CSS,XML)
5. design and construct an interactive web site(s) with regard to issues of usability, accessibility and internationalization

UNIT – I

Basic Tags of HTML, Introduction HTML5, new HTML5 Form input Types. Cascading Style Sheets.

Introduction to javascript: declaring variables, functions, event handlers (on Click , on submit etc). Form validation.

UNIT – II

Introduction to XML: Document type definition, XML Schemas, Document Object model, Presenting XML, **Using XML Processors:** DOM and SAX. Introduction to web service solution stacks XAMPP: Introduction to content Management Systems Joomla, word press.

UNIT – III

Introduction to Servlets: Common Gateway Interface (CGI), Lifecycle of a Servlet, Deploying Servlet, Servlet API, Reading Servlet parameters, Reading initialization parameters, handling Http Request & Responses. Session tracking, cookies. Connecting to a database using JDBC.

UNIT – IV

Introduction to JSP: The anatomy of a JSp page, JSP processing, Declarations, Directives, Expressions, code snippets, implicit objects. Using beans in JSP pages. Using cookies for session tracking. Connecting to database in JSP.

UNIT – V

Introduction to PHP: Downloading, installing, configuring PHP, The anatomy of a PHP Page. Basic Security Guidelines, Variables, Data Types, Operators and Expressions, Constants, Flow Control Functions; Switching Flow, Loops, Code Blocks and Browser Output, Objects, Strings Processing, Form processing, Connecting to database, using cookies, dynamic contents.

Text books:

1. Web Technologies: HTML, JAVASCRIPT, PHP, JAVA, JSP, ASP.NET, XML and Ajax, Black Book
   Web Technologies, Uttam K Roy, Oxford Press.

Reference books:

1. Chris Bates, "Web Programming, building internetapplications",2ndEdition, WILEY, Dreamtech,2008.
2. Herbert Schildt, "The complete Reference Java 2", 8th Edition, TMH,2011.
   Hans Bergsten : "Java Server Pages", 3rdEdition, O'Reilly publication, 2008.

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(E326A) DATA WAREHOUSING AND DATA MINING

Course Objectives
The Students will :

1. Explain the working of algorithms for data mining tasks
2. Discuss an overview of data preprocessing techniques.
3. Explain different data mining techniques such as characterization, comparison, classification.
4. Discuss an overview of mining complex types of data

Course Outcomes
The Students will be able to:

1. Differentiate Data warehousing and OLAP technology
2. Identify a data warehouse for an organization
3. Apply data mining techniques such as characterization, comparison, association, classification.
4. Demonstrate knowledge on mining complex types of data.

UNIT I

Introduction: Fundamentals of data mining, Data Mining Functionalities, Classification of Data Mining systems, Data Mining Task Primitives, Integration of a Data Mining System with a Database or a Data Warehouse System, Major issues in Data Mining.

Data Preprocessing: Need for Preprocessing the Data, Data Cleaning, Data Integration and Transformation, Data Reduction, Discretization and Concept Hierarchy Generation.

UNIT II

Data Warehouse and OLAP Technology for Data Mining: Data Warehouse, Multidimensional Data Model, Data Warehouse Architecture, Data Warehouse Implementation, From Data Warehousing to Data Mining

Data Cube Computation and Data Generalization: Efficient Methods for Data Cube Computation, Attribute-Oriented Induction.

Mining Frequent Patterns, Associations and Correlations: Basic Concepts, Efficient and Scalable Frequent Item set Mining Methods, Mining various kinds of Association Rules, From Association Mining to Correlation Analysis.

UNIT III

Classification and Prediction: Issues Regarding Classification and Prediction, Classification by Decision Tree Induction, Bayesian Classification, Rule-Based Classification, Classification by Back propagation, Support Vector Machines, Associative Classification, Lazy Learners, Prediction, Accuracy and Error measures, Evaluating the accuracy of a Classifier or a Predictor.

UNIT IV

Cluster Analysis Introduction: Types of Data in Cluster Analysis, A Categorization of Major

Clustering Methods, Partitioning Methods, Hierarchical Methods, Density-Based Methods, Grid-

Based Methods, Model-Based Clustering Methods, Clustering High-Dimensional Data, Constraint-Based Cluster Analysis, Outlier Analysis.

Mining Streams, Time Series and Sequence Data: Mining Data Streams, Mining Time-Series Data, Mining Sequence Patterns in Transactional Databases, Mining Sequence Patterns in Biological Data, Graph Mining, Social Network Analysis and Multi relational Data Mining.

UNIT V

Mining Object, Spatial, Multimedia, Text and Web Data: Multidimensional Analysis and Descriptive Mining of Complex Data Objects, Spatial Data Mining, Multimedia Data Mining, Text Mining, Mining the World Wide Web.

Applications and Trends in Data Mining: Data Mining Applications, Data Mining System Products and Research Prototypes, Additional Themes on Data Mining and Social Impacts of Data Mining.

TEXT BOOK:

1. Data Mining – Concepts and Techniques - Jiawei Han & Micheline Kamber, Morgan Kaufmann Publishers, Elsevier,2nd Edition,2006.
2. Introduction to Data Mining – Pang-Ning Tan, Michael Steinbach and Vipin Kumar, Pearson education.

REFERENCE BOOKS:

1. Data Mining Techniques – Arun K Pujari,2nd edition, UniversitiesPress.
2. Data Warehousing in the Real World – Sam Aanhory & Dennis Murray Pearson EdnAsia.
3. Insight into DataMining,K.P.Soman,S.Diwakar,V.Ajay,PHI,2008.

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(E326B) PRINCIPLES OF PROGRAMMING LANGUAGES

(Professional Elective-I)

(Common to CSE&IT)

Course Objectives

The Students will :

1. Discuss the background for choosing appropriate programming languages for certain classes of programming problems
2. Explain how to solve the principle to program in an imperative (or procedural), an object-oriented, a functional, and a logical programming language
3. Recognize Increase the capacity to express programming concepts and choose among alternative ways to express things.
4. Discuss principle to design a new programming language.
5. Explain the use of debuggers and related tools.

Course Outcomes

The Students will be able to:

1. Analyze semantic issues associated with function implementations, including variable binding, scoping rules, parameter passing, and exception handling.
2. Solve the implementation techniques for interpreted functional languages.
3. Show design issues of object-oriented and functional languages.
4. Illustrate with language abstraction constructs of classes, interfaces, packages, and procedures.
5. Demonstrate how to design and construct with using functional languages, be exposed to using logic languages.

UNIT I :

Preliminary Concepts: Reasons for studying, concepts of programming languages, Programming domains, Language Evaluation Criteria, influences on Language design, Language categories, Programming Paradigms – Imperative, Object Oriented, functional Programming , Logic Programming. Programming Language Implementation – Compilation and Virtual Machines, programming environments. **Syntax and Semantics:** general Problem of describing Syntax and Semantics, formal methods of describing syntax - BNF, EBNF for common programming languages features, parse trees, ambiguous grammars, attribute grammars, denotational semantics and axiomatic semantics for common programming language features.

UNIT II :

Data types: Introduction, primitive, character, user defined, array, associative, record, union, pointer and reference types, design and implementation uses related to these types. Names, Variable, concept of binding, type checking, strong typing, type compatibility, named constants, variable initialization. **Expressions and Statements:** Arithmetic relational and Boolean expressions,Shortcircuitevaluationmixedmodeassignment,AssignmentStatements,Control Structures – Statement Level, Compound Statements, Selection, Iteration, Unconditional

Statements, guarded commands.

UNIT III :

Subprograms and Blocks: Fundamentals of sub-programs, Scope of life time of varaibles, static and dynamic scope, design issues of subprograms and operations, local referencing environments, parameter passing methods, overloaded sub-programs, generic sub-programs, parameters that are sub-program names, design issues for functions user defined overloaded operators, co routines.

UNIT IV :

Abstract Data types: Abstractions and encapsulation, introductions to data abstraction, design issues, language examples, C++ parameterized ADT, object oriented programming in small talk, C++, Java, C#, Ada 95. Concurrency: Subprogram level concurrency, semaphores, monitors, massage passing, Java threads, C# threads. **Exception handling:** Exceptions, exception Propagation, Exception handler in Ada, C++ and Java. Logic Programming Language: Introduction and overview of logic programming, basic elements of prolog, application of logic programming.

UNIT V:

Functional Programming Languages: Introduction, fundamentals of FPL, LISP, ML, Haskell, application of Functional Programming Languages and comparison of functional and imperative Languages.

Scripting Language: Pragmatics, Key Concepts, Case Study: Python- Values and Types, Variables, Storage and Control, Bindings and Scope, Procedural Abstraction, Separate Compilation, Module Library.

TEXT BOOK:

1. Concepts of Programming Languages Robert .W. Sebesta 8/e, Pearson Education,2008.
2. Programming Language Design Concepts, D. A. Watt, Wiley dreamtech,rp-2007.

REFERENCE BOOKS:

1. Programming Languages, 2nd Edition, A. B. Tucker, R. E. Noonan,TMH.
2. Programming Languages, K. C. Louden, 2nd Edition, Thomson,2003.
3. LISP Patric Henry Winston and Paul Horn PearsonEducation.

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B.Tech.IT	**L**	**T-P-D**	**C**
III Year - II Semester	**4**	**0-0-0**	**4**

(E326C) WIRELESS NETWORKS AND MOBILECOMPUTING

(Professional Elective-I)

Course Objectives

The Students will :

1. Understand Wireless Application Standards &Protocols.
2. Discuss the components and important developments in Wireless Communication Networks.
3. Discuss both theoretical and practical issues of mobile computing.
4. Describe the MANET's and its routing protocols.

Course Outcomes

The Students will be able to:

1. Apply the concepts of wireless computing as compared to the conventional wire-based computing.
2. Illustrate the Framework and Principles related to wireless communications.
3. Analyze the operation of a range of commonly used wireless communication technologies.
4. Applythefunctionalitiesandcomponentsofmobilecomputingsystemsintodifferent layers and apply various techniques for realizing the functionalities.

UNIT I

Wireless Transmission: Frequencies for radio transmission, Signals, Antennas, Signal propagation, Multiplexing, Modulation, Spread spectrum, Cellular system.

(Wireless) Medium Access Control (MAC): Motivation for a Specialized MAC (Hidden and Exposed Terminals, Near and Far Terminals), SDMA, FDMA, TDMA, CDMA, MAC Protocols for GSM.

UNIT II

Wireless LAN: IEEE 802.11, Personal Area Network, IEEE 802.15.1 and IEEE 802.15.4 (Bluetooth and ZigBee), Ad-hoc and Sensor network-Introduction, Characteristics of MANET and Applications.

Mobile Computing: Types of Networks, Architecture for Mobile Computing, 3-tier Architecture

UNIT III

Mobile Computing Environment:

Design Considerations for Mobile Computing, Smart Client Architecture, The Client: User Interface, Data Storage, Performance, Data Synchronization, Messaging. The Server: Data Synchronization, Enterprise Data Source, Messaging.

GSM: Mobile Services, System Architecture, Radio Interface, Protocols, Localization and Calling, Handover, Security, and New Data Services.

UNIT IV

Mobile IP Network Layer: IP and Mobile IP Network Layers, Packet Delivery and Handover Management, Registration, Tunneling and Encapsulation, Route Optimization, DHCP.
Mobile Transport Layer: Conventional TCP/IP Protocols, Indirect TCP, Snooping TCP, Mobile TCP, Other Transport Layer Protocols for Mobile Networks.

UNIT V

Mobile OS and Building Mobile Internet Applications: Mobile Operating Systems: WinCE, Palm OS, Symbian OS, Linux, Proprietary OS Client Development : The development process, Need analysis phase, Design phase, Implementation and Testing phase, Deployment phase, Development Tools, Device Emulators.**Thin client:** Architecture, the client, Middleware, messaging Servers, Processing a Wireless request, Wireless Applications Protocol (WAP).

TEXT BOOK:

1. Mobile Communications‖, Jochen Schiller, Addison-Wesley, Second Edition,2004
2. Mobile Computing, Raj Kamal, Oxford University Press,2007

REFERENCE BOOKS:

1. Martyn Mallik: Mobile and Wireless Design Essentials, Wiley,2003
2. Mobile Computing Principles: Designing and Developing Mobile Applications with UML and XML—, Reza Behravanfar, Cambridge University Press,Oct2004.
3. HandbookofWirelessNetworksandMobileComputing‖,StojmenovicandCacute, Wiley, 2002

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(E326D) ADHOC SENSORNETWORKS

(Professional Elective-I)

Course Objectives

The Students will :

1. Understand the application, issues and challenges of MANET's.
2. Recognize the various routing protocols in MANET's.
3. Classify the security issues of wireless sensor networks
4. Estimate the sensing , communication range and its energy consumption of wireless sensor networks

Course Outcomes

The Students will be able to:

1. Demonstrate the application, issues and challenges of MANET's.
2. Apply the various routing protocols when ever required.
3. Predict and deal with the security issues of WSNs.
4. Show how data retrieval is done in sensor networks.

UNIT-I: Introduction to Ad Hoc Wireless Networks

Cellular and Ad Hoc Wireless Networks, Characteristics of MANETs, Applications of MANETs, Issues and Challenges of MANETs. **Routing in MANETs:** Classification of Routing Protocols, Topology-based versus Position-based Approaches, Topology based Routing Protocols, Position based Routing, Other Routing Protocols.

UNIT-II: Data Transmission in MANETs

The Broadcast Storm, Multicasting, Geocasting, TCP over Ad Hoc Networks-TCP Protocol overview, TCP and MANETs, Solutions for TCP over Ad Hoc. **Security in MANETs:** Security in Ad Hoc Wireless Networks, Key Management, Secure Routing, Cooperation in MANETs, Intrusion Detection Systems.

UNIT-III: Basics of Wireless Sensors and Applications

The Mica Mote, Sensing and Communication Range, Design Issues, Energy consumption, Clustering of Sensors, Applications. Sensor Node Hardware

UNIT-IV: Data Retrieval in Sensor Networks

Classification of WSNs, MAC Layer, Routing Layer, High-Level Application Layer Support, Adapting to the Inherent Dynamic Nature of WSNs.

UNIT-V: Security in WSNs

Security in Wireless Sensor Networks, Key Management in Wireless Sensor Networks, Secure Data Aggregation in Wireless Sensor Networks, Introduction to Vehicular Ad Hoc Networks,

Introduction to Wireless Mesh Networks

TEXT BOOK:

1. Ad Hoc and Sensor Networks: Theory and Applications, Carlos de Morais Cordeiro and Dharma Prakash Agrawal, World Scientific Publications / Cambridge University Press, 2006.
2. Wireless Sensor Networks: An Information Processing Approach, Feng Zhao, Leonidas Guibas, Elsevier Science Imprint, Morgan Kauffman Publishers,2005.

REFERENCE BOOKS:

1. Ad Hoc Wireless Networks: Architectures and Protocols, C. Siva Ram Murthy and B. S. Manoj, Pearson Education,2004.
2. Guide to Wireless Ad Hoc Networks, Sudip Misra, Isaac Woungang, and Subhas Chandra Misra, Springer International Edition,2011.
3. Guide to Wireless Sensor Networks, Sudip Misra, Isaac Woungang, and Subhas Chandra Misra, Springer International Edition,2012.

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(E326E) SOFTWARE TESTING METHODOLOGIES

(Professional Elective-II)

(Common to CSE &IT)

Course Objectives

The Students will :

1. Explain various software testing issues and solutions in software unit test, integration, regression, and system testing.
2. Discuss how to planning a test project, design test cases and data, conduct testing operations, manage software problems and defects, and generate a testing report.
3. Explain the advanced software testing topics, such as object-oriented software testing methods, and component-based software testing issues, challenges, and solutions.
4. Recognize software test automation problems and solutions.
5. Identify how to write software testing documents, and communicate with engineers in various forms.

Course Outcomes

The Students will be able to:

1. Analyze and design test cases using black box testing technique which includes decision tables domain testing and transition testing.
2. Analyze and design test cases for a white box testing technique which includes path testing, data flow graphs and matrix representation for a given problem.
3. Compute the path product and construct Regular Expression which is used to i identify the alternate paths from source node to destination node for any application.
4. Solve how to run test script wizard and Execute how to do performance testing using testing tools including Win runner and JMeterrespectively.
5. Demonstrate the importance of testing and its role in need of software development.

UNIT-I:

Introduction: Purpose of testing, Dichotomies, model for testing, consequences of bugs, taxonomy of bugs. Basics concepts of path testing, predicates, path predicates and achievable paths, path sensitizing, path instrumentation, application of path testing.

UNIT-II:

Transaction Flow Testing: Transaction flows, transaction flow testing techniques. Dataflow testing:- Basics of dataflow testing, strategies in dataflow testing, application of dataflow testing. **Domain Testing:** domains and paths, Nice & ugly domains, domain testing, domain and interface testing, domains and testability.

UNIT-III:

Paths, Path products and Regular expressions: Path products & path expression, reduction procedure, applications, regular expressions & flow anomaly detection.

UNIT-IV:
Logic Based Testing: Overview, decision tables, path expressions, kv charts, specifications.
State, State Graphs and Transition testing: State graphs, good & bad state graphs, state testing, Testability tips.

UNIT-V:
Graph Matrices and Application: Motivational overview, matrix of graph, relations, power of a matrix, node reduction algorithm, building tools.
Regression testing, Rapid testing, Performance testing of a data base application and HTTP connection for website access.

TEXT BOOK:
1. Software Testing techniques - Baris Beizer, Dreamtech, secondedition.
2. Software Testing Tools – Dr.K.V.K.K.Prasad,Dreamtech.

REFERENCE BOOKS:
1. The craft of software testing - Brian Marick, Pearson Education.
2. Software Testing Techniques – SPD(Oreille)
Software Testing in the Real World – Edward Kit, Pearson

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(E326F) INFORMATION RETRIEVAL SYSTEMS

(Professional Elective-II)

(Common to CSE &IT)

Course Objectives
The Students will :

1. Describe the domain of Information Retrieval is concerned with the extraction of relevant information from large collections of documents.
2. Select applications to proprietary retrieval systems as well as www, digital libraries and commercial recommendation systems.
3. Understand the main principles and methods underlying the domain of Information retrieval.
4. Discuss recent developments in IR such as collaborative filtering and Latent Semantic Indexing.

Course Outcomes
The Students will be able to:

1. Use different information retrieval techniques in various application areas
2. Apply IR principles to locate relevant information large collections ofdata
3. Analyze performance of retrieval systems when dealing with unmanaged data sources
4. Choose retrieval systems for web search tasks.

UNIT I

Introduction: Definition, Objectives, Functional Overview, Relationship to DBMS, Digital libraries and Data Warehouses. Information Retrieval System Capabilities, Search, Browse, Miscellaneous.

UNIT II

Cataloging and Indexing: Objectives, Indexing Process, Automatic Indexing, Information Extraction. Data Structures: Introduction, Stemming Algorithms, Inverted file structures, N-gram data structure, PAT data structure, Signature file structure, Hypertext data structure. **Automatic Indexing:** Classes of automatic indexing, Statistical indexing, Natural language, Concept indexing, Hypertext linkages.

UNIT III

Document and Term Clustering: Introduction, Thesaurus generation, Item clustering, Hierarchy of clusters. User Search Techniques: Search statements and binding, Similarity measures and ranking, Relevance feedback, Selective dissemination of information search, weighted searches of Boolean systems, Searching the Internet and hypertext.

UNIT IV

Information Visualization: Introduction, Cognition and perception, Information visualization technologies. Text Search Algorithms: Introduction, Software text search algorithms, Hardware text search systems. **Information System Evaluation:** Introduction, Measures used in system evaluation, Measurement example – TREC results.

UNIT V

Multimedia Information Retrieval, Models and Languages, Data Modeling, Query Languages, Indexing and Searching. Libraries and Bibliographical systems, online IR system, OPACs,Digital Libraries. 180

TEXT BOOK:

1. Information Storage and Retrieval systems Theory and Implementation Second Edition
2. Modern Information Retrieval By Ricardo Baeza-Yates, Pearson Education,2007.

REFERENCE BOOKS:

1. Information Retrieval: Algorithms and Heuristics By David A Grossman and OphirFrider, 2nd Edition,Springer.
2. Frakes, W.B., Ricardo Baeza-Yates: Information Retrieval Data Structures and Algorithms, Prentice Hall,1992.
3. Modern Information Retrival By Yates PearsonEducation.

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(E325E) CLOUD COMPUTING

(Professional Elective-III)

Course Objectives

The Students will :

1. Learn about the cloud environment, services andHadoop
2. Classify Cloud platforms and virtualizationconcepts
3. Identify Cloud computing applications and enterprise cloud computingparadigms
4. Demonistrate Cloud application development usingpython
5. Explain Security concepts in thecloud

Course Outcomes

The Students will be able to:

1. Underastand about the cloud environment, services andHadoop
2. Differentiate Cloud platforms and virtualizationconcepts
3. Describe Cloud computing applications and enterprise cloud computingparadigms
4. Implement Cloud application development usingpython
5. Apply Security concepts in thecloud

UNIT-I:

Principles of Parallel and Distributed Computing, Introduction to cloud computing, Cloud computing Architecture, cloud concepts and technologies, cloud services and platforms, Cloud models, cloud as a service, cloud solutions, cloud offerings, introduction to Hadoop and Map reduce.

UNIT-II:

Cloud Platforms for Industry, Healthcare and education, Cloud Platforms in the Industry, cloud applications. Virtualization, cloud virtualization technology, deep dive: cloud virtualization, Migrating in to cloud computing, Virtual Machines Provisioning and Virtual Machine Migration Services, On the Management of Virtual Machines for cloud Infrastructure, Comet cloud, T-Systems,

UNIT-III:

Cloud computing Applications: Industry, Health, Education, Scientific Applications, Business and Consumer Applications, Understanding Scientific Applications for Cloud Environments, Impact of Cloud computing on the role of corporateIT.

Enterprise cloud computing Paradigm, Federated cloud computing Architecture, SLA Management in Cloud Computing, Developing the cloud: cloud application Design

UNIT-IV:

Python Basics, Python for cloud, cloud application development in python, Cloud Application Development in Python.

Programming Google App Engine with Python: A first real cloud Application, Managing Data in the cloud, Google app engine Services for Login Authentication, Optimizing UI and Logic, Making the UI Pretty: Templates and CSS, Getting Interactive. Map Reduce ProgrammingModel and Implementations.

UNIT-V:

Cloud management, Organizational Readiness and change management in the cloud age , Cloud Security, Data security in the cloud, Legal Issues in the Cloud , Achieving Production Readiness for the cloud Services

TEXTBOOKS:

1. Cloud Computing: Raj Kumar Buyya , James Broberg, andrzej Goscinski, 2013Wiley
2. Mastering Cloud Computing: Raj Kumar buyya, ChristianVecchiola,selvi-2013.

REFERENCE BOOKS:

1. Cloud Computing: Arshdeep Bahga, Vijay Madisetti, 2014, UniversityPress.
2. Cloud computing: Dr Kumar Saurab Wiley India2011.
3. Code in the Cloud: Mark C.Chu-Carroll 2011, SPD.(Second part of IVUNIT)

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III Year - II Semester	**0**	**0-3-0**	**2**

(E3216) WEB TECHNOLOGIESLAB
(Common to CSE,IT)

Course Objectives
The Students will :

1. Use the fundamental concepts and features of Java Programminglanguage.
2. Recognize the basic principles of Object Oriented Programming which includes inheritance, polymorphism, encapsulation and abstraction and also Arrays, data and Text FileOperations.
3. Gain interaction, communication and collaboration, (2) knowledge creation, (3) easeof use and flexibility, and (4) writing and technologyskills
4. Execute and Incorporate best practices in navigation, usability and written content to design websites that give users easy access to the information theyseek.
5. Demonstrate an ability to use the techniques, skills, and modern engineeringtools necessary for engineeringpractice.

Course Outcomes
The Students will be able to:

1. Execute Dynamic HTML with Java Script, Methods in JavaScript, Functions inJavaScript, Events
2. Solve JavaScript, markup elements, style sheets, validation, accessibility, standards, and browsers. Upon completion, students should be able to develop hand-coded web pages using current markupstandards
3. Identify, formulate, and solve engineering problemsrecognize
4. Design and conduct experiments, as well as to analyze and interpretdata
5. Apply web application development software tools i.e. Ajax, PHP and XML etc. and identify the environments currently available on the market to design websites

EXPERIMENT 1. Create HOME PAGE for an online book store

EXPERIMENT 2. Login page for an online book store

EXPERIMENT 3. Create CATOLOGUE PAGE

EXPERIMENT 4.

Create registration form with the following fields Name, Password, confirm password, E-mail id, Phone number, Sex, Date of birth, Address

EXPERIMENT 5.

Write JavaScript to validate the following fields of the above registration modify web page appearance using CSS

EXPERIMENT 6.

Write an XML file which will display all your subjects Books information such as title, author,

isbn, name of the publisher. Create a DTD, XML Schemas to validate this XML document. Create CSS, XSL do display XML data

EXPERIMENT 7. Install XAMPP and JOOMLA or Word Press and test.

EXPERIMENT 8.

Write Servlet Program to read data submitted from Registration form and store it into the MySql database.

EXPERIMENT 9.

Write a user validation web application to read username and password submitted by the user and return successful login if the data matches, otherwise failure login.

EXPERIMENT 10.

Write a PHP program to store current date-time in a COOKIE and display the “Last visited on‟ date-time on the web page upon reopening of the same page.

EXPERIMENT 11.

Write a PHP program to store page views count in SESSION, to increment the count on each refresh, and to show the count on we page.

TEXT BOOKS:

1. Web Technologies: HTML, JAVASCRIPT, PHP, JAVA, JSP, ASP.NET, XML and Ajax, Black Book
2. Dietel and Dietel : —Internet and World Wide Web - How to Program‖, 5th Edition, PHI/Pearson Education,2011

REFERENCE BOOKS:

1. Chris Bates, —Web Programming, building internet applications‖, 2ndEdition, WILEY, Dreamtech,2008.
2. Herbert Schildt, —The complete Reference Java 2‖, 8th Edition, TMH,2011.
3. Hans Bergsten : —Java Server Pages‖, 3rdEdition, O‘Reilly publication,2008.

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(E3217) DATA MINING LAB

Course Objectives
The Students will :

1. Discuss to perform data mining tasks using a data mining toolkit (such as open source WEKA),
2. Express the practical exposure on implementation of well known data miningtasks
3. Examine to real life data sets for analysis andprediction.
4. Predict the performance evaluation of data mining algorithms in a supervised andan unsupervised setting.

Course Outcomes
The Students will be able to:

1. Apply data mining process and important issues around data cleaning, pre-processing and integration.
2. Examine principle algorithms and techniques used in data mining, such asclustering, association mining, classification and prediction
3. Show practical experience using data mining techniques on real world datasets.
4. Show hands-on experience working with all real datasets.

Credit Risk Assessment

Description: The business of banks is making loans. Assessing the credit worthiness of an applicant is of crucial importance. You have to develop a system to help a loan officer decide whether the credit of a customer is good, or bad. A bank's business rules regarding loans must consider two opposing factors. On the one hand, a bank wants to make as many loans as possible. Interest on these loans is the banks profit source. On the other hand, a bank cannot afford to make too many bad loans. Too many bad loans could lead to the collapse of the bank. The bank's loan policy must involve a compromise: not too strict, and not too lenient.

To do the assignment, you first and foremost need some knowledge about the world of credit. You can acquire such knowledge in a number of ways.

1. Knowledge Engineering. Find a loan officer who is willing to talk. Interview her and try to represent her knowledge in the form of productionrules.

2. Books. Find some training manuals for loan officers or perhaps a suitable textbook on finance. Translate this knowledge from text form to production ruleform.

3. Common sense. Imagine yourself as a loan officer and make up reasonable rules which can be used to judge the credit worthiness of a loanapplicant.

4. Casehistories.Findrecordsofactualcaseswherecompetentloanofficerscorrectlyjudged

when, and when not to, approve a loan application.

The German Credit Data:
Actual historical credit data is not always easy to come by because of confidentiality rules. Here is one such dataset, consisting of 1000 actual cases collected in Germany. credit dataset **Error! Hyperlink reference not valid.** Excel **Error! Hyperlink reference not valid.** version of the German credit data. (Down load from web) In spite of the fact that the data is German, you should probably make use of it for this assignment. (Unless you really can consult a real loan officer!)
A few notes on the German dataset
• DM stands for Deutsche Mark, the unit of currency, worth about 90 cents Canadian (but looks and acts like aquarter).
• owns_telephone. German phone rates are much higher than in Canada so fewer people own telephones.

• foreign_worker. There are millions of these in Germany (many from Turrkey). It is very hard to get German citizenship if you were not born of Germanparents.
• There are 20 attributes used in judging a loan applicant. The goal is the classify the applicant into one of two categories, good orbad.
(Turn in your answers to the following tasks)

EXPERIMENT I: Study thoroughly the credit assessement problem.

EXPERIMENT II: List all the categorical (or nominal) attributes and the real-valued attributes separately.

EXPERIMENT III: What attributes do you think might be crucial in making the credit assessement? Come up with some simple rules in plain English using your selected attributes.

EXPERIMENT IV: One type of model that you can create is a Decision Tree - train a Decision Tree using the complete dataset as the training data. Report the model obtained aftertraining.

EXPERIMENT V: Suppose you use your above model trained on the complete dataset, and classify credit good/bad for each of the examples in the dataset. What % of examples can you classify correctly? (This is also called testing on the training set) Why do you think you cannot get 100 % training accuracy?

EXPERIMENT VI: Is testing on the training set as you did above a good idea? Why or Why not?

EXPERIMENT VII: One approach for solving the problem encountered in the previous question is using cross-validation? Describe what cross-validation is briefly. Train a Decision Tree again using cross-validation and report your results. Does your accuracy increase/decrease?Why?

EXPERIMENT VIII: Check to see if the data shows a bias against "foreign workers" (attribute 20),or "personal-status" (attribute 9). One way to do this (perhaps rather simple minded) is to remove these attributes from the dataset and see if the decision tree created in those cases is

significantly different from the full dataset case which you have already done. To remove an attribute you can use the preprocess tab in Weka's GUI Explorer. Did removing these attributes have any significant effect? Discuss.

EXPERIMENT IX: Another question might be, do you really need to input so many attributes to get good results? Maybe only a few would do. For example, you could try just having attributes 2, 3, 5, 7, 10, 17 (and 21, the class attribute (naturally)). Try out some combinations. (You had removed two attributes in problem 7. Remember to reload the arff data file to get all the attributes initially before you start selecting the ones you want.)

EXPERIMENT X: Sometimes, the cost of rejecting an applicant who actually has a good credit (case 1) might be higher than accepting an applicant who has bad credit (case 2). Instead of counting the misclassifications equally in both cases, give a higher cost to the first case (say cost 5) and lower cost to the second case. You can do this by using a cost matrix in Weka. Train your Decision Tree again and report the Decision Tree and cross-validation results. Are they significantly different from results obtained in problem 6 (using equal cost)?

EXPERIMENT XI: Do you think it is a good idea to prefer simple decision trees instead of having long complex decision trees? How does the complexity of a Decision Tree relate to the bias of the model?

EXPERIMENT XII: You can make your Decision Trees simpler by pruning the nodes. One approach is to use Reduced Error Pruning - Explain this idea briefly. Try reduced error pruning for training your Decision Trees using cross-validation (you can do this in Weka) and report the Decision Tree you obtain? Also, report your accuracy using the pruned model. Does your accuracy increase?

EXPERIMENT XIII: How can you convert a Decision Trees into "if-then-else rules". Make up your own small Decision Tree consisting of 2-3 levels and convert it into a set of rules. There also exist different classifiers that output the model in the form of rules - one such classifier in Weka is rules. PART, train this model and report the set of rules obtained. Sometimes just one attribute can be good enough in making the decision, yes, just one ! Can you predict what attribute that might be in this dataset? OneR classifier uses a single attribute to make decisions (it chooses the attribute based on minimumerror).

EXPERIMENT XIV: Report the rule obtained by training a one R classifier. Rank the performance of j48, PART and oneR.

TEXT BOOK:

1. Data Mining – Concepts and Techniques - Jiawei Han & Micheline Kamber, Morgan Kaufmann Publishers, Elsevier,2nd Edition,2006.
2. Introduction to Data Mining – Pang-Ning Tan, Michael Steinbach and Vipin Kumar, Pearsoneducation.

REFERENCE BOOKS:

1. Data Mining Techniques – Arun K Pujari,2nd edition, UniversitiesPress.
2. Data Warehousing in the Real World – Sam Aanhory & Dennis Murray Pearson EdnAsia.
3. Insight into Data Mining, K.P.Soman, S.Diwakar, V.Ajay,PHI,2008.

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(E3218) EMPLOYABILITY SKILLS

(Common to EEE, ECE, CSE, IT & ECM)

Course Objectives

The Students will :

1. Equip the students to gain Employability Skills and to have successfulcareers.
2. Enable them to use English Language in different socio cultural andProfessional contexts.
3. Assist them to communicate their ideas relevantly and coherently in theGlobalised environment.

Course Outcomes

The Students will be able to:

1. Gain employment and function successfully in theircareers.
2. Use English successfully in different socio-cultural and professionalcontexts
3. Communicate their ideas coherently in globalizedsituations**.**

LISTENING:

1. Listening Comprehension-
exercises • ActiveListening

READING:

2. Reading Comprehension – 4Passages
3.Book Review-Any Novel among the list prescribed by theDepartment
4.ClozeTest

SPEAKING:

5. Extempore • AdMaking
6.One Act Plays • Posterpresentation
7.Public Speaking • Mock Interviews
8.Group Discussions •Assertiveness
9. Interpersonalskills

WRITING:

10.Teambuilding

VOCABULARY :

11. BusinessVocabulary

CREATIVITY :

12. Short Films •Leadership

TEXTBOOKS:

1. Effective Technical Communication, M. Ashraf Rizvi, Tata Mc. Graw-Hill PublishingCompany Ltd.
2.Enhancing Employability @ Soft Skills by Shalini Verma–Pearson.

REFERENCE BOOKS :

1. Effective Technical Communication, M. Ashraf Rizvi, Tata Mc. Graw-Hill PublishingCompany Ltd.
2. Communication Skills by Leena Sen, Prentice-Hall of India,2005.

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IV Year - I Semester	**4**	**1-0-0**	**4**

(E416A) AUTOMATA AND COMPILER DESIGN

Course Objectives:

The Student will

1. Illustrating different phases of compilation.
2. Describe the steps and algorithms used by language translators and features.
3. Enumerating top down and bottom up parsing techniques used in compilation process.
4. Introducing the syntax directed translation and type checking and learning the effectiveness of optimization.
5. To learn to develop algorithms to generate code for a target machine.

Course Outcomes:

The Student will be able to:

1. Analyze phases of compilation, particularly lexical analysis, parsing, semantic analysis and code generation.
2. Construct parsing tables for different types of parsing techniques.
3. Classify the Semantic Analysis and Intermediate code generation phase.
4. Apply code optimization techniques to different programming languages.
5. Generate object code for natural language representations.

UNIT – I

Formal Language and Regular Expressions: Languages, Definition Language regular expressions, Finite Automata-DFA, NFA.

Conversions: conversion of regular expression to NFA, NFA to DFA, Applications of Finite Automata to lexical analysis-lex tools.

UNIT – II

Context Free grammars and parsing: Context free grammars, derivation, parse trees, ambiguity LL (K) Grammars and LL (1) parsing.

Bottom up parsers: Bottom up parsing handle pruning LR Grammar Parsing, LALR Parsing, Parsing ambiguous grammars,YACC Programming specification.

UNIT – III

Semantics: Syntax directed translation, S-attributed and L-attributed grammars, and Intermediate code-abstract, syntax tree, translation of simple statements and control flow statements.

Type checking:

Type checking, type conversions, equivalence of type expressions, overloading of functions and operations.Context sensitive features- Chomsky hierarchy of languages and recognizers.

UNIT – IV

Run time storage: Storage organization, storage allocation strategies scope access to now local names, parameters, language facilities for dynamics storage allocation.

Code optimization: Principal sources of optimization of basic blocks, peephole optimization, flow graphs, data flow analysis of flow graphs.

UNIT – V

Code generation: Machine dependent code generation, object code forms, generic code generation algorithm, register allocation and assignment using DAG representation of Block.

TEXT BOOK:

1. Compilers Principles, Techniques & Tools, Alfred V. Aho, Monica S. Lam, Ravi Sethi and Jeffery D. Ullman, Pearson Addison Wesley Education, Second Edition.
2. Modern Compiler Implementation in C, Andrew N. Appel, Cambridge University Press.

REFERENCE BOOKS:

1. Lex&yacc , John R. Levine, Tony Mason, Doug Brown, O‟reilly
2. Modern Compiler Design, Dick Grune, Henry E. BAL, Cariel T. H. Jacobs, Wiley dreamtech.
3. Engineering a Compiler, Cooper & Linda, Elsevier.
4. Compiler Construction, Louden, Thomson.
5. Systems Programming and Operating Systems, D

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(E416B) EMBEDDED SYSTEMS

Course Objectives:

The Student will:

1. Understand the basic concepts of embedded systems.
2. Classify the basics of assembly programming language.
3. Identify the unique characteristics of real-time systems.
4. Understand the software development tools and debugging techniques.
5. Express the various embedded system advanced architectures.

Course Outcomes:

The Student will be able to:

1. Design embedded systems and real-time systems
2. Program on 8051 micro controller assembly language.
3. Describe Tasks, Semaphores, Message queues, pipes, Timer functions,RTOS.
4. Analyze software development tools and use of debugging tools.
5. Compare ARM, SHARC, and internet enabled systems.

UNIT -I:

Embedded Computing: Introduction, complex systems and microprocessor.

The embedded system design process: Requirements, specifications, architecture design, designing hardware and software components, system integration, formalisms for system design, design examples.

UNIT -II:

The 8051 Architecture: Introduction, 8051 micro controller hardware, input/output ports and circuits, external memory, counter and timers, serial data input/output, interrupts.

Basic Assembly Language Programming Concepts: The assembly language programming process, programming tools and techniques, programming the 8051. Data transfer and logical instructions, arithmetic operations, decimal arithmetic, jump and call instructions.

UNIT -III:

Introduction to Real-Time Operating Systems: Tasks and task states, tasks and data, semaphores, and shared data; message queues, mailboxes and pipes, timer functions, events, memory management, interrupt routines in an RTOS environment.

Basic Design Using a Real-Time Operating System: Principles, hard real-time scheduling considerations, saving memory and power, an example RTOS like uC-OS (open source).

UNIT -IV:

Embedded Software Development Tools: Host and target machines, linker/locators for embedded software, getting embedded software into the target system

Debugging Techniques: Testing on host machine, using laboratory tools, an example system.

UNIT -V:

Introduction to advanced Architectures: ARM and SHARC, processor and memory organization and instruction level parallelism.

N**etworked embedded systems:** bus protocols, I2C bus and CAN bus; internet-enabled systems, design example-elevator controller.

TEXT BOOKS:

1. Wayne Wolf (2008), Computers as Components-principles of embedded computer system design, Elseveir, New Delhi, India.
2. Kenneth J. Ayala (2008), The 8051 Microcontroller, 3rd edition, Cengage Learning, India.

REFERENCE BOOKS:

1. David E. Simon (1999), An Embedded Software Primer, Pearson Education, India.
2. Jean J. Labrosse (2000), Embedding System Building Blocks, 2nd edition, CMP publishers, USA.
3. Raj Kamal (2004), Embedded Systems, Tata McGraw hill, India.

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(E416C) INTERNET OF THINGS

(Professional Elective-III)

(Common to IT & CSE)

Course Objectives

The Students will :

1. Understand the current vision of the Internet of Things and its impact on the world
2. Classify basic concepts of IoT and M2M & IoT system management
3. Describe concepts of python language and different python packages.
4. Explain how to design IoT Physical devices with built-ins of python Programs
5. Identify the advanced concepts of IoT physical servers, cloud offerings and Hadoop

Course Outcomes

The Students will be able to:

1. Analyze current vision of the Internet of Things and its impact on the world.
2. Demonstrate basic concepts of IoT and M2M & IoT system management
3. Practice the concepts of python language using different python packages
4. Design IoT Physical devices using python Programming.
5. Categorize advanced concepts of IoT physical servers, cloud offerings and Hadoop

UNIT-I:

Introduction to Internet of Things –Introduction, Definition and Characteristics of IoT,
Physical Design of IoT –Things inIoT, IoT Protocols, Logical Design of IOT- IoT Functional Blocks,IoTCommunication Models, IoT Communication APIs

IoT Enabling Technologies – Wireless Sensor Networks, Cloud Computing, Big Data Analytics, Communication Protocols, Embedded Systems, IoT Levels and Deployment Templates.
Domain Specific IoTs – Introduction, Home Automation, Cities, Environment, Energy, Retail, Logistics, Agriculture, Industry, Health and Lifestyle.

UNIT-II:

IoT and M2M – Introduction,M2M,Difference between IOT and M2M,SDN and NFV for IoT-Software Defined Networking, Network Function Virtualization,
IoT System Management with NETCONF-YANG- Need for IoT Systems Management, Simple Network Management Protocol (SNMP), Network Operator Requirements,NETCONF, YANG, NETOPEER.

UNIT-III:

IoT Systems-Logical Design Using Python-Introduction, Installing Python, Data types and Data Structures, Control Flow, Functions, Modules, Packages, File handling, Date/Time Operations, Classes.

Python Packages of Interest for IoT- JSON, XML, HTTPLib, URLLib, SMTPLib.

UNIT-IV:

IoT Physical Devices and Endpoints – What is an IoT Device,Exemplary Device: Raspberry Pi,About the Board,Linux on Raspberry Pi, Raspberry PI-Interfaces (Serial, SPI, I2C),Programming

Raspberry Pi with Python-Controlling LED, Interfacing an LED and Switch and interfacing a light sensor with Raspberry Pi,**OtherIoT Devices**- PcDuino,BeagleBone Black,Cubieboard

UNIT-V:

IoT Physical Servers and Cloud Offerings – Introduction to Cloud Storage Models and communication APIs, WAMP-AutoBahn for IoT,Xively Cloud for IoT, Python web application framework Designing a RESTful web API,Amazon web services for IOT.

Data Analytics for IOT: Introduction ,Apache Hadoop, Using Hadoop MapReduce for Batch Data Analysis,Hadoop YARN.

TEXT BOOKS:

1. Internet of Things - A Hands-on Approach, ArshdeepBahga and Vijay Madisetti, Universities Press, 2015, ISBN: 9788173719547
2. Getting Started with Raspberry Pi, Matt Richardson & Shawn Wallace, O'Reilly (SPD), 2014, ISBN: 9789350239759

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B.Tech. IT	**L**	**T-P-D**	**C**
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(E416D) DISTRIBUTED DATABASES

(Professional Elective-III)

Course Objectives:

The Student will:

1. Acquire knowledge on parallel and distributed databases and its applications
2. Discuses the Topics include distributed DBMS architecture and design; query processing and optimization;
3. Understand the Management of Distributed Transactions and Concurrency Control.
4. Explain Distributed transaction management and reliability; parallel and object database management systems
5. Understand the Homogeneous and Heterogeneous Distributed database systems.

Course Outcomes:

The Student will be able to :

1. Explain the techniques used for data fragmentation, replication, and allocation during the distributed database design process.
2. Evaluate simple strategies for executing a distributed query to select the strategy that minimizes the amount of data transfer.
3. Explain how the two-phase commit protocol is used to deal with committing a transaction that accesses databases stored on multiple nodes.
4. Describe distributed concurrency control based on the distinguished copy techniques and the voting methods
5. Apply the knowledge in various types of Distributed Database Systems.

UNIT I

Distributed Databases: **An Overview**

Features of Distributed versus Centralized Databases, Principles of Distributed Databases, Levels Of Distribution Transparency, Reference Architecture for Distributed Databases, Types of Data Fragmentation, Integrity Constraints in Distributed Databases,

Distributed Database Design:

A Framework for Distributed Database Design, The Design of Database fragmentation, The allocation of Fragments.

UNIT II

Translation of Global Queries to Fragment Queries: Equivalence transformations for Queries,

Transforming Global Queries into Fragment Queries, Distributed Grouping and Aggregate Function Evaluation, Parametric Queries.
Optimization of Access Strategies: A Framework for Query Optimization, Join Queries, General Queries.

UNIT III
The Management of Distributed Transactions: A Framework for Transaction Management, Supporting Atomicity of Distributed Transactions, Concurrency Control for Distributed Transactions, Architectural Aspects of Distributed Transactions.
Concurrency Control: Foundation of Distributed Concurrency Control, Distributed Deadlocks, Concurrency Control based on Timestamps, Optimistic Methods for Distributed Concurrency Control.

UNIT IV
Reliability: Basic Concepts, Nonblocking Commitment Protocols, Reliability and concurrency Control, Determining a Consistent View of the Network, Detection and Resolution of Inconsistency, Checkpoints and Cold Restart.
Distributed Database Administration: Catalog Management in Distributed Databases, Authorization and Protection.

UNIT V
Distributed Database Systems: Commercial Systems, Tandem's ENCOMPASS Distributed Database System IBM's Inter System communication.
Other Homogeneous Distributed Database Systems: DDM: A Distributed Database Manager Based on Adaplex, Distributed-INGRES.
Heterogeneous Distributed Database Systems: Problems of Heterogeneous Distributed Databases, MULTIBASE.

TEXT BOOKS:

1. Distributed Databases Principles & Systems, Stefano Ceri, Giuseppe Pelagatti,TMH.
2. Principles of Distributed Database Systems, M. Tamer Ozsu, Patrick Valduriez ,Pearson Education, 2nd Edition.

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(E415A)BIG DATA ANALYTICS

(Professional Elective-III)

(Common to CSE & IT)

Course objectives:

The Students will :

1. Understand the basics of Big Data and Big data Platform
2. Attain the knowledge of Big Data analytics, Approaches and Tools
3. Describe MapReduce fundamentals and HDFC File system
4. Differentiate between Hadoop and RDBMS concepts
5. Apply analytics on Structured and Unstructured Data.

Course Outcomes:

The Students will be able to:

1. Know the basics of Big Data and its environment
2. Achieve the knowledge of Big Data analytics Tools and its Approaches
3. Define MapReduce fundamentals and HDFC Architecture
4. Distinguish between Hadoop and RDBMS concepts
5. Illustrate analytics on Structured and Unstructured Data.

UNIT-I

Introduction to Big Data : What is big data, History of Data Management , Structuring Big Data , Elements of Big Data , Big Data Analytics, Distributed and Parallel Computing for Big Data

Big Data Analytics:What is Big Data Analytics, What Big Data Analytics Isn't, Why this sudden Hype Around Big Data Analytics, Classification of Analytics, Greatest Challenges that Prevent Business from Capitalizing Big Data; Top Challenges Facing Big Data; Why Big Data Analytics Important; Data Science; Data Scientist; Terminologies used in Big Data Environments; Basically Available Soft State Eventual Consistency (BASE); Open source Analytics Tools

UNIT-II:

Understanding Analytics and Big Data: Comparing Reporting and Analysis, Types of Analytics; Points to Consider during Analysis; Developing an Analytic Team; Understanding Text Analytics;
Analytical Approach and Tools to Analyze Data: Analytical Approaches; History of Analytical Tools; Introducing Popular Analytical Tools; Comparing Various Analytical Tools.

UNIT-III:

Understanding MapReduce Fundamentals and HBase : The MapReduce Framework; Techniques to Optimize MapReduce Jobs; Uses of MapReduce; Role of HBase in Big Data Processing; Storing Data in Hadoop

Introduction of HDFS: Architecture, HDFC Files, File system types, commands, org.apache.hadoop.io package, HDF, HDFS High Availability; Introducing HBase, Architecture, Storing Big Data with HBase , Interacting with the Hadoop Ecosystem; HBase in Operations-Programming with HBase; Installation, Combining HBase and HDFS

UNIT-IV:

Big Data Technology Landscape and Hadoop : NoSQL, Hadoop; RDBMS versus Hadoop; Distributed Computing Challenges; History of Hadoop; Hadoop Overview; Use Case of Hadoop; Hadoop Distributors;

HDFC (Hadoop Distributed File System): HDFC Daemons, read,write, Replica Processing of Data with Hadoop; Managing Resources and Applications with Hadoop YARN

UNIT-V:

Social Media Analytics and Text Mining: Introducing Social Media; Key elements of Social Media; Text mining; Understanding Text Mining Process; Sentiment Analysis, Performing Social Media Analytics and Opinion Mining on Tweets;

Mobile Analytics: Introducing Mobile Analytics; Define Mobile Analytics; Mobile Analytics and Web Analytics; Types of Results from Mobile Analytics; Types of Applications for Mobile Analytics; Introducing Mobile Analytics Tools

TEXT BOOKS:

1. BIG DATA and ANALYTICS, Seema Acharya, Subhasinin Chellappan, Wiley publications.
2. BIG DATA, Black Book™ , DreamTech Press, 2015 Edition.
3. BUSINESS ANALYTICS 5e , BY Albright |Winston

REFERENCE BOOKS:

1. Rajiv Sabherwal, Irma Becerra- Fernandez," Business Intelligence –Practice, Technologies and Management", John Wiley 2011.
2. Lariss T. Moss,ShakuAtre, " Business Intelligence Roadmap", Addison-Wesley It Service.
3. Yuli Vasiliev, " Oracle Business Intelligence : The Condensed Guide to Analysis and Reporting", SPD Shroff, 2012

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(E415C) WEB SERVICES

(Common to CSE & IT)

(Professional Elective – IV)

Course objectives:

The Students will :

1. Students will evaluate distributed computing and Core distributed computing technologies
2. Students will describe the architecture and characteristics of web service.
3. The Student will describe xml document structure and Core fundamentals of SOAP.
4. The Student will define Web services technologies: WSDL, UDDI.
5. The Student will illustrate security mechanism and overview of : .Net and J2EE,SOA.

Course outcomes:

The Students will be able to:

1. The student will be able to describes distributed computing technologies — client/server, CORBA, JAVA RMI, Microsoft DCOM, MOM.
2. The student will be able to Analyze Web Services Architecture
3. The student will be able to memorize Fundamentals of SOAP .
4. The student will be able to explain Web Services and service discovery mechanisms, UDDI.
5. The student will be able to describes Web Services Interoperability and Web Services Security

UNIT-I:

Evolution emergence of Web Services -Evolution of distributed computing, Core distributed computing technologies–client/server, CORBA, JAVA RMI, Micro Soft DCOM, MOM, Challenges in Distributed Computing, role of J2EE and XML in distributed computing, emergence of Web Services and Service Oriented Architecture (SOA).

Introduction to Web Services–The definition of web services, basic operational model of web services, tools and technologies enabling web services, benefits and challenges of using web services.

UNIT-II:

Web Service Architecture –Web services Architecture and its characteristics, core building blocks of web services, standards and technologies available for implementing web services, web services communication, basic steps of implementing web services.

Describing Web Services –WSDL introduction, non functional service description, WSDL1.1 Vs WSDL 2.0, WSDL document, WSDL elements, WSDL binding, WSDL tools, WSDL port type, limitations of WSDL.

UNIT-III:

Brief Over View of XML -XML Document structure, XML namespaces, Defining structure in XML documents, Reuse of XML schemes, Document navigation and transformation.

SOAP : Simple Object Access Protocol- Inter-application communication and wire protocols, SOAP as a messaging protocol, Structure of a SOAP message, SOAP envelope, Encoding, Service Oriented Architectures -SOA revisited, Service roles in a SOA, Reliable messaging, The enterprise Service Bus, SOA Development Lifecycle, SOAP HTTP binding, SOAP communication model, Error handling in SOAP.

UNIT-IV:

Registering and Discovering Services -The role of service registries, Service discovery, Universal Description, Discovery, and Integration, UDDI Architecture, UDDI Data Model, Interfaces, UDDI Implementation, UDDI with WSDL, UDDI specification

Service Addressing and Notification-Referencing and addressing Web Services, Web Services Notification.

UNIT-V:

Securing SOA and Web Services:SOA and web services security considerations, Network-level security mechanisms, Application-level security topologies, XML security standards,

Semantics and Web Services:The semantic interoperability problem, The role of metadata, Service metadata, Overview of .NET and J2EE,SOA and Web Service Management:Managing Distributed System, Enterprise management Framework, Standard distributed management frameworks, Web service management, Richer schema languages, WS-Metadata Exchange.

TEXT BOOKS:

1. Developing Java Web Services, R. Nagappan, R. Skoczylas, R.P. Sriganesh, Wiley India
2. Web Services & SOA Principles and Technology, Second Edition, Michael P. Papazoglou.

REFERENCE BOOKS:

1. Developing Enterprise Web Services, S. Chatterjee, J. Webber, Pearson Education.
2. XML, Web Services, and the Data Revolution, F.P.Coyle, Pearson Education.
3. Building web Services with Java, 2 nd Edition, S. Graham and others, Pearson Education.

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(E416E) SOFTWARE ARCHITECTURE AND DESIGN PATTERN

(Common to IT & CSE)

(Professional Elective-IV)

Course Objectives

The Students will :

1. Understand that design patterns are standard solutions to common software design problems
2. Discuss to know how to use systematic approach that focus and describe that describe abstract systems of interaction between classes ,objects and communication flow
3. Understand the architecture evaluation and design decision making
4. Understand how to apply these patterns on various platforms.
5. Understand the responsibilities for developing software.

Course Outcomes

The Students will be able to:

1. Apply a deeper knowledge of the principles of Object Oriented Design.
2. Show the knowledge of the design patterns that are common in software applications.
3. Illustrate the knowledge of these patterns that are related to object –oriented design.
4. Analyze various architectural patterns
5. Apply the Knowledge for developing a software.

UNIT I

Envisioning Architecture: The Architecture Business Cycle, What is Software Architecture, Architectural patterns, reference models, reference architectures, architectural structures and views.

Creating an Architecture: Architecture and Quality Attributes, Achieving qualities, Architectural styles and patterns, designing the Architecture, Documenting software architectures, Reconstructing Software Architecture.

UNIT II

Analyzing Architectures: Architecture Evaluation, Architecture design decision making, ATAM, CBAM.

Moving from one system to many: Software Product Lines, Building systems from off the shelf components, Software architecture in future.

UNIT III

Introduction to design patterns: Patterns,Pattern Description, Organizing catalogs, role in

solving design problems, Selection and usage.

Design pattern catalog: Creational and Structural patterns, Abstract factory, builder, factory method, prototype, singleton, adapter, bridge, composite, façade, fly weight.

UNIT IV

Behavioral patterns: Chain of responsibility, command, Interpreter, iterator, mediator, memento, observer, state, strategy, template method, visitor.

UNIT V

Case Studies: A-7E –A case study in utilizing architectural structures, The World Wide Web -a case study in interoperability.

Air Traffic Control –a case study in designing for high availability, Celsius Tech –a case study in product line development.

TEXT BOOKS:

1. Software Architecture in Practice, second edition, Len Bass, Paul Clements & Rick Kazman, Pearson Education, 2003.
2. Design Patterns, Erich Gamma, Pearson Education, 1995.

REFERENCE BOOKS:

1.Software Architecture in Practice, Len Bass, Paul Clements, Rick Kazman.
2. Documenting Software Architectures: Views and Beyond Paul Clements, Felix Bachmann, Len Bass, David Garlen, James Ivers, Reed Little, Robert Nord, Judith Stafford

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(E416F) SOFTWARE PROJECT MANAGEMENT

(Common to IT & CSE)

(PROFESSIONAL ELECTIVE-IV)

COURSE OBJECTIVES:

The Students will:

1. Discuss the conventional and contemporary software project management principles.
2. Discuss the key phases of software project management and their key skills.
3. Understand the ability to assess and plan project schedule and assign resources
4. Select an appropriate project development methodology among various alternating processes.
5. Identify project risks, understand the responsibilities, monitor and track project deadlines and the capability to work in a team environment.

COURSE OUTCOMES:

The Student will be able to:

1. Describe the conventional software management and explain how to improve software economics
2. Understand and discuss the key phases of project management and the key skills associated with each.
3. Explain the concept of workflows and checkpoints of the processes.
4. Discuss the responsibilities in the project organization.
5. Distinguish between conventional project and modern project profiles.

UNIT-I

Conventional Software Management: The waterfall model, conventional software management performance.

Evolution of Software Economics: Software Economics.

Improving Software Economics: Reducing software product size, Improving software processes, Improving team effectiveness, Improving automation, Achieving required quality.

UNIT-II

The old way and the New way: The principles of conventional software engineering, Principles of modern software management.

Life Cycle Phases: Engineering and Production stages, Inception, Elaboration, Construction, Transition phases.

Artifacts of the Process: The artifact sets, Management artifacts, Engineering artifacts, Pragmatic artifacts.

UNIT-III

Model Based Software Architectures: A Management perspective and Technical perspective.
Work Flows of the Process: Software process workflows, Iteration workflows.
Checkpoints of the Process: Major milestones, Minor milestones, Periodic status assessments.
Iterative Process Planning: Work breakdown structures, planning guidelines, cost and schedule estimating, Iteration planning process.

UNIT-IV

Project Organizations and Responsibilities: Line-of-business organizations, Project organizations.
Process Automation: Automation building blocks.
Project Control and Process Instrumentation: The seven core metrics, Management indicators, quality indicators, life cycle expectations, pragmatic software metrics.

UNIT-V

Future Software Project Management: Modern project profiles, next generation software economics, modern process transitions.
Tailoring the Process: Process discriminants.
Case Study: The command centre processing and display system-replacement (CCPDS-R)

TEXT BOOKS:

1. Software Project Management, Walker Royce: Pearson Education, 2005
2. Software Project Management, Joel Henry: Pearson Education

REFERENCE BOOKS:

1. Software Project Management, Bob Hughes and Mike Cotterell: Tata McGraw-Hill Edition.
2. Software Project Management in practice, Pankaj Jalote, Pearson Education, 2005

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(E415G) INFORMATION SECURITY
(PROFESSIONAL ELECTIVE-V)

Course objectives:
The Students will :

1. Define about security goals, security attacks, security services and security mechanism.
2. Describe conventional encryption algorithms& public-key encryption algorithms,digital Signature and issues of key Management
3. Explain authentication application & discuss how PGP and S/MIME can provide security services for e-mail.
4. Discuss IP security, Web Security.
5. Discuss system level security issues include threats, Intruders, Intrusion detection system and firewalls.

Course outcomes:
The Student will be able to:

1. Analyze the security goals, security attacks, security services and security mechanism, cryptography.
2. Compare how conventional encryption algorithms &public key cryptography can be used to ensure the Identity of the sender of an encrypted message.
3. Identify authentication application & discuss how PGP and S/MIME can provide security services for e-mail.
4. Identify IP security, Web security using Secure Socket Layer (SSL) and Transport Layer Security (TLS), Secure Electronic Transaction (SET).
5. Apply system level security includes threats, Intruders, Intrusion detection System and Firewalls.

UNIT-I:

Introduction: Security Attacks (Interruption, Interception, Modification and Fabrication), Security Services (Confidentiality, Authentication, Integrity, Non-repudiation, access Control and Availability) and Mechanisms, A model for Internetwork security, Internet Standards and RFCs.

Understanding Attacks: Buffer overflow & format string vulnerabilities, TCP session hijacking, ARP attacks, route table modification, UDP hijacking, and man-in-the-middle attacks.

UNIT-II:

Symmetric Encryption and Message Authentication: Conventional Encryption Principles, Conventional encryption algorithms, cipher block modes of operation,

location of encryption devices, key distribution .

Public-Key Cryptography and Message Authentication: Approaches of Message Authentication, Secure Hash Functions and HMAC Public key cryptography principles, public key cryptography algorithms, digital signatures, digital Certificates, Certificate Authority and key management.

UNIT-III:

Authentication Applications: Kerberos, X.509 Directory Authentication Service.

Electronic Mail Security: Pretty Good Privacy (PGP) and Secure /Multipurpose Internet Mail Extension (S/MIME)

UNIT-IV:

IP Security: IP Security Overview, IP Security Architecture, Authentication Header, Encapsulating Security Payload, Combining Security Associations and Key Management.

Web Security: Web Security Requirements, Secure Socket Layer (SSL) and Transport Layer Security (TLS), Secure Electronic Transaction (SET).

UNIT-V:

Network Management Security: Basic concepts of SNMP, SNMPv1 Community facility and SNMPv3.

System Security: Intruders, Viruses and related threats. Firewall Design principles, Trusted Systems. Intrusion Detection Systems.

TEXT BOOKS:

1. Network Security Essentials (Applications and Standards) by William Stallings Pearson Education.
2. Hack Proofing your network by Ryan Russell, Dan Kaminsky, Rain Forest Puppy, Joe Grand, David Ahmad, Hal Flynn Ido Dubrawsky, Steve W.Manzuik and Ryan Permeh, Wiley Dreamtech

REFERENCE BOOKS:

1. Network Security and Cryptography: Bernard Menezes, CENGAGE Learning.
2. Network Security - Private Communication in a Public World by Charlie Kaufman, Radia Perlman and Mike Speciner, Pearson/PHI.
3. Cryptography and network Security, Third edition, Stallings, PHI/Pearson

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(E415F) CYBER SECURITY
(Common to CSE & IT)
(Professional Elective – V)

Course objectives:

The Student will :

1. Recognize cyber crimes and how they are planned
2. Identify the vulnerabilities of mobile and wireless devices
3. Examine the crimes in mobile and wireless devices and Acts.
4. Understand about Computer Forensics
5. Explored to Cyber Security- Organizational Implications

Course outcomes:

The student will be able to:

1. Demonstrate cyber crimes and how they are planned
2. Develop a framework to secure Mobile and wireless devices
3. Interpret crimes and Acts related to mobile and wireless devices
4. Memorize Computer Forensics and its related matters
5. Identify Cyber Security-Organizational Implications

UNIT-I :

Introduction to Cybercrime: Introduction, Cybercrime and Information security, who are cybercriminals,Classifications of Cybercrimes, Cybercrime: The legal Perspectives and Indian Perspective, Cybercrime and the Indian ITA 2000, A Global Perspective on Cybercrimes.

Cyber offenses: How criminals Plan Them: Introduction, How Criminals plan the Attacks, SocialEngineering, Cyber stalking, Cyber cafe and Cybercrimes, Botnets: The Fuel for Cybercrime, Attack Vector, Cloud Computing.

UNIT-II :

Cybercrime: Mobile and Wireless Devices: Introduction, Proliferation of Mobile and Wireless Devices,Trends in Mobility, Credit card Frauds in Mobile and Wireless Computing Era, Security Challenges Posed by Mobile Devices, Registry Settings for Mobile Devices, Authentication service Security, Attacks on Mobile/Cell Phones,

Mobile Devices: Security Implications for Organizations, Organizational Measures for Handling Mobile, Organizational Security Policies an Measures in Mobile Computing Era, Laptops.

UNIT- III:

Cybercrimes and Cyber security: the Legal Perspectives: Introduction: Cyber Crime and LegalLandscape around the world.

Why Do We Need Cyber laws: The Indian Context, The Indian IT Act, Challenges to Indian Law and Cybercrime Scenario In India, Digital signatures and the Indian IT Act, Amendments to the Indian IT Act, Cybercrime and Punishment

Cyber law, Technology and Students: Indian Scenario.

UNIT- IV :

Understanding Computer Forensics

Introduction, Historical background of Cyber forensics, Digital Forensics Science, The Need for Computer Forensics, Cyber Forensics and Digital evidence, Forensics Analysis of Email.

Digital Forensics Lifecycle Chain of Custody concept, Network Forensics, Approaching a computer, Forensics Investigation, Challenges in Computer Forensics, Special Tools and Techniques Forensics Auditing.

UNIT-V:

Cyber Security: Organizational Implications

Introduction, Cost of Cybercrimes and IPR issues, Web threats for Organizations, Security and Privacy Implications,

Social media marketing: Security Risks and Perils for Organizations, Social Computing and the associated challenges for Organizations.

TEXT BOOKS:

1. **Cyber Security**:*Understanding Cyber Crimes, Computer Forensics and Legal Perspectives*, NinaGodbole and Sunil Belapure, Wiley INDIA.
2. **Introduction to Cyber Security** , Chwan-Hwa(john) Wu,J.David Irwin.CRC Press T&F Group

REFERENCE BOOK:

1. **Cyber Security Essentials**, James Graham, Richard Howard and Ryan Otson, CRC Press.

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B.Tech. IT	**L**	**T-P-D**	**C**
IV Year – I Semester	**4**	**0-0-0**	**4**

(E415D) DATABASE SECURITY
(Common to CSE & IT)

(Professional Elective – V)

Course Objectives:

The Student will :

1. Understand and implement security models and algorithms in database security.
2. Study the various security mechanisms.
3. Study different software design for data security
4. Learn the statistical database protection system.
5. Study the various protection models for new generation database systems.

Course Outcomes:

The Student will be able to:

1. To demonstrate the knowledge gained through solving problems to define security models in database security.
2. To evaluate the different security mechanisms over operating system.
3. To enlist various software designs for database security.
4. To design and implement statistical database protection system.
5. To describe the developing areas of new generation database system with different protection models.

UNIT-I:

Introduction

Introduction to Databases Security Problems in Databases Security Controls Conclusions

Security Models -1.

Introduction Access Matrix Model Take-Grant Model Action Model PN Model Hartson and Hsiao's Model Fernandez's Model Bussolati and Martella's Model for Distributed databases

UNIT-II:

Security Models -2

Bell and LaPadula's Model Biba's Model Dion's Model Sea View Model Jajodia and Sandhu'sModel The Lattice Model for the Flow Control conclusion.

Security Mechanisms

Introduction User Identification/Authentication Memory Protection Resource Protection Control FlowMechanisms Isolation Security Functionalities in Some Operating Systems Trusted Computer System Evaluation Criteria

UNIT-III:

Security Software Design

Introduction A Methodological Approach to Security Software Design Secure Operating

SystemDesign Secure DBMS Design Security Packages Database Security Design

UNIT-IV:

Statistical Database Protection & Intrusion Detection Systems

Introduction Statistics Concepts and Definitions Types of Attacks Inference Controls evaluation**Criteria for Control Comparison**: Introduction IDES System RETISS System ASES System Discovery

UNIT-V:

Models For The Protection Of New Generation Database Systems -1

Introduction A Model for the Protection of Frame Based Systems A Model for the Protection of Object-oriented ,Systems SORION Model for the Protection of Object-Oriented Databases

Models For The Protection Of New Generation Database Systems -2

A Model for the Protection of New Generation Database Systems: the Orion Model Jajodia and Kogan's Model A Model for the Protection of Active Databases Conclusions

TEXT BOOKS:

1. Database Security and Auditing, Hassan A. Afyouni, India Edition, CENGAGE Learning,2009.

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B.Tech. IT	**L**	**T-P-D**	**C**
IV Year I- Semester	**0**	**0-3-0**	**2**

(E4112) EMBEDDED SYSTEMS LAB

Course Objectives:

The Student will

1. Understand programs using assembly language.
2. Explain usage of various addressing modes.
3. Describe the input and output functionality of microcontroller.
4. Recognize the interaction with microcontroller for different purposes.

Course Outcomes:

The Student will be able to:

1. Write programs using assembly language.
2. Use of various addressing modes.
3. Show the input and output functionality of microcontroller.
4. Illustrate the interaction with microcontroller by writing programs

Experiment I: Write asimple assembly program on Arithmetic Operations

Experiment II: Write a simple assembly program on Logical Operations.

Experiment III: Writea program on Addressing modes.

Experiment IV: Write a program to Read inputs from switches in 89c51 SDK

Experiment V: Write a assembly program to perform the following operations

I. RR
II. RRC
III. RL
IV. RLC

- Write and simple assembly program for SWAP the content of registers R7 and R6 in RB0 (With using MOV, PUSH, POP, XCH operations)

Experiment VI: Write a assembly program to perform the following operations **]**

I. Conditional JUMP
II. Un Conditional JUMP
III. CALL instructions

- Write and assembly program on Timers for generating time delay.

Experiment VII: Write a program to read inputs and blink the LEDs in different patterns in 89cSDK.

Experiment VIII: Write a Program for serial Communication between Microcontrollers to PC vice versa

- For Microcontroller to PC communication the data should be transferred from

microcontroller to PC Terminal window.

- For PC to microcontroller communication the data should be transferred from PC terminal window to Microcontroller LCD display.

Experiment IX: Sort RTOS on to 89c51 Microcontroller and verify.

- Run 2 to 3 tasks simultaneously on 89c51 SDK
- Use LCD interface, LED interface, Serial communication.

ExperimentX: Write a program to read input from switches display the switch number in seven segment display and Develop necessary interfacing circuit to process display. (example : if we press switch 1 it should display 1 on the seven segment display)

Experiment XI: Write a program to display Real time Clock on SEVEN SEGMENT DISPLAY and Develop necessary interfacing circuit to process TIME display.

Experiment XII: Write a program that generate ramp signal on the DAC output.

TEXT BOOKS:

1. KVKKF Prasad: Embedded /Real-Time Systems, Dreamtech,Press.
2. The 8051 micro controller & Embedded Systems using assembly and C By Kenneth J.Ayala Dhananjay V.Gadre

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B.Tech. IT	**L**	**T-P-D**	**C**
IV Year II- Semester	**4**	**0-0-0**	**4**

(E426A) MOBILE APPLICATION DEVELOPMENT

Course Objectives:
The Student will:

1. Discuss different software engineering techniques for mobile applications and apply this knowledge to develop an application for a mobile device.
2. Describe the design and architecture of a mobile application.
3. Identify new programming techniques to meet the requirements of a mobile application.
4. Understand the challenges that mobile programming has in providing an effective user interface.

Course Outcomes:
The Student will be able to:

1. Design, implement and evaluate a User Interface for a mobile application using J2ME.
2. Create a small but realistic working mobile application for small computing devices.
3. Categorize the challenges posed by developing mobile applications and be able to propose and evaluate and select appropriate solutions.
4. Apply the key technological principles and methods for delivering and maintaining mobile applications
5. Develop and apply current standard-compliant scripting/programming techniques for the successful deployment of mobile applications targeting a variety of platforms.

UNIT I:
J2ME Overview : Java 2 Micro Edition and the World of Java, Inside J2ME, J2ME and Wireless Devices Small Computing Technology Wireless Technology, Radio Data Networks, Microwave Technology, Mobile Radio Networks, Messaging, Personal Digital Assistants .

J2ME Architecture and Development Environment:J2ME Architecture, Small Computing Device Requirements, Run-Time Environment, MIDlet Programming, Java Language for J2ME, J2ME Software Development Kits, Hello World J2ME Style, Multiple MIDlets in a MIDlet Suite, J2ME Wireless Toolkit.

UNIT II:
J2ME Best Practices and Patterns: The Reality of Working in a J2ME World, Best Practices, Commands, Items, and Event Processing, J2ME User Interfaces, Display Class, The Palm OS Emulator, Command Class, Item Class, Exception Handling.

UNIT III:

High-Level Display: Screens: Screen Class, Alert Class, Form Class, Item Class, List Class, Text Box Class, Ticker Class Low-Level Display: Canvas: The Canvas, User Interactions, Graphics, Clipping Regions, Animation.

UNIT IV:

Record Management System:Record Storage, Writing and Reading Records, Record Enumeration, Sorting Records, Searching Records, Record Listener.

JDBC Objects: The Concept of JDBC, JDBC Driver Types, JDBC Packages, Overview of the JDBC Process, Database Connection, statement Objects, Result set, Transaction Processing, Metadata, Data Types, Exceptions.

UNIT V:

JDBC and Embedded SQL: Model Programs, Tables, Indexing, Inserting Data into Tables, Selecting Data from a Table, Metadata, Updating Tables, Deleting Data form a Table, Joining Tables, Calculating Data, Grouping and Ordering Data, Sub queries, VIEWs.

Generic Connection Framework:The Connection, Hypertext Transfer Protocol, Communication Management Using HTTP Commands, Session Management, Transmit as a Background Process.

TEXT BOOK

1. J2ME: The Complete Reference, James Keogh, Tata McGrawHill.
2. Beginning J2ME: From Novice to Professional, Third Edition, Sing Li, Jonathan B. Knudsen, Apress, 2005

REFERENCE BOOKS

1. Enterprise J2ME: Developing Mobile Java Applications – Michael Juntao Yuan, Pearson Education, 2004
2. Beginning Java ME Platform, Ray Rischpater, Apress, 2009
3.Kicking Butt with MIDP and MSA:Creating Great Mobile Applications,1st edition, J.Knudsen,Pearson

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B.Tech. IT	**L**	**T-P-D**	**C**
IV Year II- Semester	**0**	**0-3-0**	**2**

(E4217) MOBILE APPLICATION DEVELOPMENT LAB

Course Objectives:

The Student will:

1. Understand the J2ME software tool kit.
2. Discuss about the profile and configuration used to implement an application in a device.
3. Discuss the packages used for different applications.
4. Identify the challenges that mobile programming has in providing an effective user interface.

Course Outcomes:

The Student will be able to:

1. Produce a user interface for a mobile application using J2ME.
2. Discover a small but realistic working mobile application for small computing devices.
3. Apply the key technological principles and methods for delivering and maintaining mobile applications.
4. Apply current standard-compliant scripting/programming techniques for the successful deployment of mobile applications targeting a variety of platforms.

Experiment - I: Installation of Java Wireless Toolkit (J2ME)

Experiment- II: Working with J2ME Features:

Create a Hello World program which creates to following kind of menu.

- Cut.
- Copy.
- Past.
- delete.
- Select all.
- Unselect all.

Experiment-III: Event Handling.

Create a menu which has the following options:

- cut - can be on/off
- copy - can be on/off
- paste - can be on/off
- delete - can be on/off

- select all - put all 4 options on
- unselect all - put all 4 options off

Experiment-IV: Input checking
Create an MIDP application which examine, that a phone number, which a user has entered is in the given format.

- Area code should be one of the following: 040, 041, 050, 0400, 044
- There should 6-8 numbers in telephone number (+ area code)

Experiment- V: Threads & High Level UI:
3.1. Create a slide show which has three slides, which includes only text. Program should change to the new slide after 5 seconds. After the third slide program returns to the first slide.

Experiment-VI: High-level UI
Create a MIDP application, which show to the user 5-10 quiz questions. All questions have 4 possible options and one right option exactly. Application counts and shows to the user how many right answers were right and shows them to user.

Experiment-VII: Create a MIDP application, where the user can enter player name and points. The program saves the information to the record using RMS at MIDP device. Program should also print out the top 10 player list to the end user. You can use this class in your game if you made own class for saving and reading record sets.

Experiment-VIII: Working on Drawing and Images
Create a slide show which has three slides, which includes pictures at PNG format. Program should change to the new slide other 5 seconds.

Experiment-IX: Create a MIDP application, which draws a bar graph to the display. Data values can be given at int[] array.

Experiment-X: Create a MIDP application, which draws a bar graph to the display. Data values can be given at int[] array. You can enter four data (integer) values to the input text field.

Experiment – XI: Developing Networked Applications using the Wireless Toolkit

- Creating a Simple Client-Server Application
- Create, compile and run a basic UDP-based client-server application.
- Creating the Datagram Server project

Experiment – XII: Authentication with a Web Server

- Write a sample program to show how to make a SOCKET Connection from j2me phone.
- Login to HTTP Server from a J2ME Program

Note: Use Apache Tomcat Server as Web Server and Mysql as Database Server.

Experiment - XIII & XIV Web Application using J2ME

The following should be carried out with respect to the given set of application domains: (Assume that the Server is connected to the well-maintained database of the given domain. Mobile Client is to be connected to the Server and fetch the required data value/information)

- Students Marks Enquiry
- Town/City Movie Enquiry
- Railway/Road/Air (For example PNR) Enquiry/Status
- Sports (say, Cricket) Update
- Town/City Weather Update
- Public Exams (say Intermediate or SSC)/ Entrance (Say EAMCET) Results Enquiry

Divide Student into Batches and suggest them to design database according to their domains and render information according the requests.

TEXT BOOKS:

1. J2ME: The Complete Reference, James Keogh, Tata McGrawHill.
2. Beginning J2ME: From Novice to Professional, Third Edition, Sing Li, Jonathan B. Knudsen, Apress, 2005

REFERENCE BOOKS:

1. Enterprise J2ME: Developing Mobile Java Applications – Michael Juntao Yuan, Pearson Education, 2004
2. Beginning Java ME Platform, Ray Rischpater, Apress, 2009
3. Kicking Butt with MIDP and MSA:Creating Great Mobile Applications,1st edition,J.Knudsen,Pearson.

Open Elective - I

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B.Tech.	**L**	**T-P-D**	**C**
III Year - I Semester	**3**	**0-0-0**	**3**

DISASTER MANAGEMENT
(Open Elective – I)

Course Objectives:

The students will :

1. To provide basic conceptual understanding the difference between the hazard and a disaster.
2. To gain knowledge about the various disasters and their impacts.
3. To provide basic understanding about the hazard and vulnerability profile of India.
4. To have conceptual understanding about the disaster management phases.
5. To gain approaches of Disaster Risk Reduction (DRR) and the relationship between vulnerability, Disasters, disaster prevention and risk reduction.

UNIT - I:

Concept of Disaster, Different approaches, Concept of Risk, Levels of Disasters, Disaster Phenomena and Events (Global, national and regional) ,Hazards and Vulnerability, Natural and man-made hazards, response time, frequency and forewarning levels of different hazards, Characteristics and damage potential or natural hazards, hazard assessment ,Dimensions of vulnerability factors, vulnerability assessment Vulnerability and disaster risk ,Vulnerabilities to flood and earthquake hazards.

UNIT II:

Disaster Management Mechanism, Concepts of risk management and crisis managements. Disaster Management Cycle, Response and Recovery Development, Prevention, Mitigation and Preparedness ,Planning for Relief.

UNIT - III:

Capacity Building: Concept, Structural and Non-structural Measures ,Capacity Assessment; Strengthening Capacity for Risk reduction ,Counter-Disaster Resources and their utility in Disaster Management ,Legislative Support at the state and national levels.

UNIT - IV:

Coping with Disaster, Coping Strategies; alternative adjustment processes, Changing Concepts of disaster management ,Industrial Safety Plan; Safety norms and survival kits, Mass media and disaster management.

UNIT - V:

Planning for disaster management, Strategies for disaster management planning, Steps for formulating a disaster risk reduction plan, Disaster management Act and Policy in India. Organizational structure for disaster management in India, Preparation of state and district disaster management plans .

TEXT BOOKS:

1. Alexander, D. Natural Disasters, ULC press Ltd, London, 1993.
2. Carter, W.N. Disaster Management: A Disaster Management Handbook, Asian Development Bank, Bangkok, 1991.
3. Manual on Natural Disaster Management in India, NCDM, New Delhi, 2001.

REFERENCES:

1. Abarquez I. & Murshed Z. Community Based Disaster Risk Management: Field Practitioner's Handbook, ADPC, Bangkok, 2004.
2. Goudie, A. Geomorphological Techniques, Unwin Hyman, London 1990.
3. Goswami, S.C Remote Sensing Application in North East India, Purbanchal Prakesh, Guwahati, 1997.

Course Outcomes:

The Students will be to

1. acquired knowledge on various types of disasters and hazards.
2. distinguish between the hazard and a disaster can be analyzed.
3. acquired knowledge on the various approaches of Disaster Risk Reduction (DRR)
4. ability to understand the relationship between vulnerability, disasters, disaster prevention and risk reduction.
5. develop ability to respond to different disasters.

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B.Tech.	**L**	**T-P-D**	**C**
III Year - I Semester	**3**	**0-0-0**	**3**

Elements of Civil Engineering
(Open Elective-I)

Course Objectives:

The students will:

1. To understand different methods of surveying for various applications.
2. To familiarize with various types of building materials.
3. To understand transportation and traffic management.
4. The knowledge of water sources, supply& its treatment.
5. Study about Highway development in India, Necessity for Highway planning, different road development plans..

UNIT - I:

Introduction, history of the civil engineering, sub – disciplines of civil engineering.

UNIT II:

Surveying

Introduction, divisions of surveying, classification of surveying, principles of surveying. Linear measurements and errors–introduction, methods of linear measurements, chaining instruments, types of error and correction. Compass surveying – introduction, angular measurement using compass, whole circle bearing and reduced bearing, fore bearing and back bearing. Traverse surveying –introduction, chain and compass traversing, closing error and adjustments. Levelling– introduction, types of levelling instruments, dumpy level, adjustment of level, levelling staff.

UNIT - III:

Building Materials and Construction

Materials: Introduction to construction materials like ferrous and non ferrous metals, alloys, Stones, Bricks, Lime, Cement, Timber, Sand, Aggregates, Mortar, Concrete and bitumen. Construction: Types of building, different loads considered in building design, types of foundation in building, other developments and constructions of buildings.

UNIT - IV:

Fire and Earthquake Protection in Building Introduction, fire protection in building, structural and architectural safety requirements of resistive structures, fire resistive properties of building materials, fire exit requirements, force and acceleration on building due to earthquake, building response characteristics, building drift.

UNIT - V:

Water Supply, Sanitary and Electrical Works in Building

Introduction, water supply system, water supply layout of a building, house drainage, traps, electrical works in building.

Highway Engineering:

Introduction, historical background of road or highway, classification of roads, pavements and roads, traffic control mechanism.

TEXT BOOKS:

1. Elements of Civil Engineering Author: Mimi Das Saikia, Bhargab Mohan Das and Madan Mohan Das Publisher: PHI Learning Private Limited New Delhi.
2. Elements of Civil Engineering Author: Dr. R.K. Jain and Dr. P.P. Lodha Publisher: McGraw Hill Education, India Pvt. Ltd.
3. Surveying Vol. I Author: Dr. B. C. Punmia, Ashokkumar Jain, Arunkumar Jain16th Edition Publisher: Laxmi Publication Delhi.
4. Building drawing Author: M.G.Shah, C.M.Kale and S.Y.Patki Publisher: Tata McGraw Hill.

Reference Books:

1. Surveying Theory and Practice (7th Edition) Author: James M Anderson and Edward M Mikhail Publisher: McGraw Hill Education, India Pvt. Ltd.
2. Surveying and Leveling Author: R. Subramanian Publisher: Oxford University.
3. Building drawing Author: M.G.Shah, C.M.Kale and S.Y.Patki Publisher: Tata McGraw Hill.
4. Civil Engg. Drawing Author: S. C. Rangwala Publisher: Charotar Pub. House Anand.

Course Outcomes:

Students will be able to

1. Carry out simple land survey and prepare maps showing the existing details.
2. Find out area of irregular shaped plane areas.
3. Understand building plan, elevation and section.
4. Get acquainted with construction materials and transportation systems.
5. Understand transportation and traffic problems.

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B.Tech.	**L**	**T-P-D**	**C**
III Year – I Semester	**3**	**0-0-0**	**3**

Network Analysis and Synthesis
(Open Elective - I)

UNIT I:
Concept of generalized frequency, circuit representation and their response in terms of generalized frequency.

UNIT II:
Fourier transforms and series, Laplace transform, its properties, and Z transforms, its properties and applications, Concept of one port, two-port networks, characteristics and parameters.

UNIT III:
Generalized network functions (Driving point and Transfer), concepts of poles and zeros, determination of free and forced response from poles and zeros, concept of minimum phase networks, analysis of ladder, lattice, T and bridged-T networks.

UNIT IV:
Introduction to state-space representation of networks and their analysis. Concept of filtering, filter types and characteristics, classical design of T and PI passive filters, frequency transformations. Introduction to active filters, active filter specifications, design of first and second order RC –active filters, maximally flat and equi-ripple filter characteristics, implementation using passive elements and op-amps.

UNIT V:
Network synthesis- Synthesis problem formulation, properties of positive real functions, Hurwitz polynomials, properties of RC, LC and RL driving point functions, Foster and Cauer synthesis of LC and RC circuits.

Text Books:

1. Temes & LaPatra – Introduction to circuit Synthesis & Design, McGraw Hill.
2. V. Valkenberg – Modern Network Synthesis, PHI.

Reference Books:

1. Weinberg – Network Analysis & Synthesis, McGraw Hill.
2. Peikari – Fundamentals of Network Analysis & Synthesis, Wiley.
3. V. Atre-- Network Theory and Filter design, TMH.

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B.Tech.	**L**	**T-P-D**	**C**
III Year – I Semester	**3**	**0-0-0**	**3**

Measurements and Instruments

(Open Elective - I)

UNIT - I:

Philosophy Of Measurement- Methods of Measurement, Measurement System, Classification of instrument system, Characteristics of instruments & measurement system, Errors in measurement & its analysis, Standards.

Analog Measurement of Electrical Quantities –Electrodynamics , Thermocouple, Electrostatic & Rectifier type Ammeters & Voltmeters , Electrodynamics' Wattmeter, Three Phase Wattmeter, Power in three phase system , errors & remedies in wattmeter and energy meter. Instrument Transformer and their applications in the extension of instrument range, Introduction to measurement of speed , frequency and power factor.

UNIT - II:

Measurement of Parameters- Different methods of measuring low, medium and high resistances, measurement of inductance & capacitance with the help of AC Bridges, Q Meter.

AC Potentiometer- Polar type & Co-ordinate type AC potentiometers , application of AC Potentiometers in electrical measurement.

UNIT - III:

Magnetic Measurement- Ballistic Galvanometer, flux meter , determination of hysteresis loop, measurement of iron losses

UNIT - IV:

Digital Measurement of Electrical Quantities- Concept of digital measurement, block diagram Study of digital voltmeter, frequency meter Power Analyzer and Harmonics Analyzer; Electronic Multimeter.

UNIT - V:

Cathode Ray Oscilloscope - Basic CRO circuit (Block Diagram),Cathode ray tube (CRT) & its components , application of CRO in measurement ,Lissajous Pattern.; Dual Trace & Dua Beam Oscilloscopes.

Text Books:

1. E.W. Golding & F.C. Widdis, - Electrical Measurement &Measuring Instrument‖, A.H. Wheeler& Co. India.
2. A.K. Sawhney, -Electrical & Electronic Measurement & Instrument‖, Dhanpat Rai & Sons

Reference Books:

1. Forest K. Harries,—Electrical Measurement, Willey Eastern Pvt. Ltd. India .
2. M.B. Stout ,—Basic Electrical Measurement‖ Prentice hall of India.
3. W.D. Cooper,‖ Electronic Instrument & Measurement Technique — Prentice Hall International.
4. Rajendra Prashad ,—Electrical Measurement &Measuring Instrument‖ Khanna Publisher.
5. J.B. Gupta, -Electrical Measurements and Measuring Instruments‖, S.K. Kataria & Sons.

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B. Tech.	**L**	**T-P-D**	**C**
III Year - I Semester	**3**	**0-0-0**	**3**

AUTOMOBILE ENGINEERING
(OPEN ELECTIVE-I)

UNIT – I: Introduction : Components of four wheeler automobile – chassis and body – power unit – power transmission – rear wheel drive, front wheel drive, 4 wheel drive – types of automobile engines, engine construction – engine lubrication, splash and pressure lubrication systems, oil filters, oil pumps – crank case ventilation – engine service, reboring, decarburization, Nitriding of crank shaft. Emission from Automobiles – Pollution standards, National and international – Pollution Control – Techniques – Noise Pollution & control.

UNIT – II: Fuel System: S.I. Engine: Fuel supply systems, Mechanical and electrical fuel pumps – carburetor – types – air filters – petrol injection. Electronic injection system
C.I. Engines: Requirements of diesel injection systems, types of injection systems, fuel pump, nozzle, Alternative fuels for Automobiles-injection, Classification, Properties, Hybrid vehicles injection timing, testing of fuel, pumps.

UNIT – III: Cooling System : Cooling Requirements, Air Cooling, Liquid Cooling and Forced Circulation System – Radiators – Types – Cooling Fan - water pump, thermostat, evaporating cooling – pressure sealed cooling – antifreeze solutions.
Ignition System : Function of an ignition system, battery ignition system, constructional features of storage battery, auto transformer, contact breaker points, condenser and spark plug – Magneto coil ignition system, electronic ignition system using contact breaker, electronic ignition using contact triggers – spark advance and retard mechanism.

UNIT – IV: Electrical System : Charging circuit, generator, current – voltage regulator – starting system, bendix drive mechanism solenoid switch, lighting systems, Horn, wiper, fuel gauge – oil pressure gauge, engine temperature indicator etc
Transmission System : Clutches, principle, types, cone clutch, single plate clutch, multi plate clutch, magnetic and centrifugal clutches, fluid fly wheel – Gear boxes, types, sliding mesh, construct mesh, synchro mesh gear boxes, epicyclic gear box , over drive torque converter.Propeller shaft – Hoatch – Kiss drive, Torque tube drive universal joint, differential rear axles– types – wheels and tyres.

UNIT – V: Steering System : Steering geometry – camber, castor, king pin rake, combined angle toe in, center point steering. Types of steering mechanism – Ackerman steering mechanism, Davis steering mechanism, steering gears – types, steering linkages.
Suspension System : Objects of suspension systems – rigid axle suspension system, torsion bar, shock absorber, Independent suspension system.
Braking System : Mechanical brake system, Hydraulic brake system, Master cylinder, wheel cylinder tandem master cylinder Requirement of brake fluid, Pneumatic and vacuum brakes.

TEXT BOOKS :

1. Automobile Engineering ,Vol. 1 & Vol. 2/ Kripal Singh
2. Automobile Engineering , Vol. 1 & Vol. 2 ,by K.M Gupta,Umesh publication
3. Automobile Engineering - K.K.Ramalingam –scitech lab

REFERENCE BOOKS :

1. A System approach to Automotive Technology by Jack Erjavec YesDee publishing pvt Ltd.
2. Automobile Engineering / William Crouse
3. Automotive Mechanics / Heitner
4. Alternative fuels of Automobiles by P.RamiReddy, Frontline publications.

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ENGINEERING MATERIALS AND FABRICATION PROCESSES

(OPEN ELECTIVE – I)

UNIT-I: FERROUS ALLOYS: Introduction, Designations and classifications for steels, Simple Heat Treatments, Effect of Alloying Elements.

NONFERROUS ALLOYS: Introduction, properties and applications, Aluminum Alloys, Magnesium Alloys, Copper Alloys and Titanium Alloys.

CERAMIC MATERIALS: Introduction, Properties and Applications of Ceramics, Glasses and Refractories

POLYMERS: Introduction, Classification of Polymers, Polymerization, Degree of Polymerization, Typical Thermoplastics and Thermosets.

COMPOSITES: Introduction, Classification, Properties and Applications of Polymer matrix, Metal Matrix Ceramic Matrix and Laminar composites.

UNIT-II: Casting : Steps involved in making a casting – Advantage of casting and its applications; Patterns - Pattern making, Types, Materials used for patterns, pattern allowances and their construction; Properties of moulding sands.

Methods of Melting - Crucible melting and cupola operation – Defects in castings;

Casting processes – Types – Sand moulding, Centrifugal casting, die- casting, Investment casting, shell moulding; Principles of Gating – Requirements – Types of gates, Design of gating systems – Riser – Function, types of Riser and Riser design.

UNIT-III: Welding: Classification – Types of welds and welded joints; Gas welding - Types, oxy-fuel gas cutting. Arc welding, forge welding, submerged arc welding, Resistance welding, Thermit welding.

Inert Gas Welding _ TIG Welding, MIG welding, explosive welding, Laser Welding; Soldering and Brazing; Heat affected zone in welding. Welding defects – causes and remedies; destructive and non- destructive testing of welds.

UNIT-IV: Hot working, cold working, strain hardening, recovery, re-crystallization and grain growth. Stamping, forming and other cold working processes. Blanking and piercing – Bending and forming – Drawing and its types – wire drawing and Tube drawing – coining – Hot and cold spinning. Types of presses and press tools. Forces and power requirement in the above operations.

UNIT-V: Extrusion of Metals : Basic extrusion process and its characteristics. Hot extrusion and cold extrusion - Forward extrusion and backward extrusion – Impact extrusion – Extruding equipment – Tube extrusion and pipe making, Hydrostatic extrusion. Forces in extrusion

Forging Processes: Forging operations and principles – Tools – Forging methods – Smith forging, Drop Forging – Roll forging – Forging hammers : Rotary forging – forging defects – cold forging, swaging, Forces in forging operations.

TEXT BOOKS:

1. Donald R. Askland, Pradeep P. Phule, The Science and Engineering of Materials (4th Edition), Thomson Publishers, 2003.
2. William D. Callister Introduction to Material Science and Engineering, John Wiley and Sons, 2007.
3. W.F.Smith, Principles of Materials Science and Engineering, Mc Graw Hill, New York, 1994.

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B.Tech.	**L**	**T-P-D**	**C**
III Year - I Semester	**3**	**0-0-0**	**3**

Principles of Electronic Communications
(OPEN ELECTIVE – I)

Course objectives: The Student will

1. gain knowledge about modulation and various analog modulation schemes.
2. have a broad understanding of Pulse modulation schemes.
3. obtain knowledge on Digital modulation techniques.
4. illustrate the wireless networking concepts.
5. understand the principle of cellular mobile radio systems.

Unit I: Introduction
Block diagram of Electrical communication system, Radio communication, Types of communications: Analog, pulse and digital. Analog Modulation: Need for modulation, Types of Analog modulation, Amplitude Modulation.
Angle Modulation: Frequency & Phase modulations. Generation and Demodulation techniques. Advantages of FM over AM, Bandwidth consideration, Narrow band and Wide band FM, Comparison of FM & PM.

Unit II: Pulse Modulations
Sampling, Nyquist rate of sampling, sampling theorem for Band limited signals, PAM, regeneration of base band signal.
PWM and PPM, Time Divison Multiplexing, Frequency Divison Multiplexing, Asynchronous Multiplexing.

Unit III: Digital Communication
Advantages, Block diagram of PCM, Quantization, effect of quantization, quantization error, Base band digital signal, DM, ADM, ADPCM and comparison.
Digital Modulation: ASK, FSK, PSK, DPSK, QPSK demodulation, offset and non-offset QPSK, coherent and incoherent reception, Modems.

Unit IV: Introduction to Wireless Networking
Introduction, Difference between wireless and fixed telephone networks,
Development of wireless networks, Traffic routing in wireless networks.

Unit V: Cellular Mobile Radio Systems
Introduction to Cellular Mobile System, concept of frequency reuse, Performance criteria, uniqueness of mobile radio environment, operation of cellular systems, Hexagonal shaped cells, Analog and Digital Cellular systems, Cell splitting.
Handoffs and Dropped Calls Handoff, dropped calls and cell splitting, types of handoff, handoff initiation, delaying handoff, forced handoff, mobile assisted handoff, Intersystem

handoff, micro cells, vehicle locating methods, dropped call rates and their evaluation.

TEXT BOOKS:

1. Communication Systems Analog and Digital – R.P. Singh and SD Sapre, TMH, 20th reprint, 2004.
2. Wireless Communications, Principles, Practice – Theodore, S. Rappaport, 2nd Ed., 2002,PHI.

REFERENCE BOOKS:

1. Wireless Communication and Networking – William Stallings, 2003, PHI.
2. Electronic Communication Systems – Kennedy and Davis, TMH, 4th edition, 2004.
3. Communication Systems Engineering – John. G. Proakis and Masoud Salehi, PHI, 2ndEd. 2004.

Course outcomes: The Student will be able to

1. acquire knowledge about analog and angle modulation techniques.
2. illustrate the concepts of Pulse modulation schemes.
3. obtain knowledge on Digital modulation techniques.
4. describe the wireless networking concepts.
5. understand the basics of cellular mobile radio systems and types of handoff.

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B.Tech	**L**	**T-P-D**	**C**
III Year I Semester	**3**	**0-0-0**	**3**

MATLAB PROGRAMMING

(Open Elective-I)

Course objectives: The Student will

1. gain knowledge in exploring MATLAB software.
2. be able to find approach for solving Engineering problems using simulation tools.
3. be prepared to use MATLAB in their project works.
4. gain a foundation in use of this software for real time applications.
5. practice numerical methods, simulations and understand MATLAB programming.

UNIT-I: MATLAB basics, The MATLAB Environment, Basic computer programming, Variables and constants, operators and simple calculations, Formulas and functions, MATLAB toolboxes, Exercises.

UNIT-II: Matricers and vectors, Matrix and linear algebra review, vectors and matrices in MATLAB.

Matrix operations and function in MATLAB, Exercises**.**

UNIT-III: Computer programming, Algorithms and structures, MATLAB scripts and functions (m-files).

Simple sequential algorithms, control structures (if…then, loop), Exercises.

UNIT-IV: MATLAB programming, Reading and writing data, file handling, personalized functions.

Toolbox structure, MATLAB graphic functions, Exercises.

UNIT-V: Numerical simulations-Numerical methods and simulations, Random number generation, Montecarlo methods statistics Toolbox, User‘s Guide: Random Number and Generation Functions).

Hands-on session

Interactive hands-on-session where the whole class will develop one or more MATLAB scripts that solve an assigned problem.

TEXT BOOK:

1. MATLAB Programming by Y.Kirani Singh, B.B Chowdari , PHI publications, 2007 edition.
2. MATLAB And Its Applications In Engineering By Rajkumar Bansal , Ashok Kumar Goel, Manoj Kumar Sharma, Pearson Education Publications, version 7.5.

REFERENCE BOOKS:

1. Getting Started With MATLAB By Rudrapratap, Oxford Publication, 2002 Edition.

Course outcomes: The Student will be able to

1. develop programming and simulation for engineering problems.
2. estimate importance of software’s in research by simulation work.
3. prepare basic mathematical, electrical, electronic problems in MATLAB.
4. synthesis basic electronic circuits in simulink.
5. interpret programming files with GUI Simulink.

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DATA STRUCTURES THROUGH C
(Open Elective-I)

Course Objectives:

The Student will:

1. Review the basic concepts of data structures and algorithms.
2. Classify basic concepts of stacks, queues.
3. Understanding searching and sorting techniques.
4. Classify basic concepts about stacks, queues ,lists ,trees and graphs.
5. Know step by step approach in solving problems with the help of fundamental data structures.

UNIT - I:

Data Structures – Introduction to Data Structures, abstract data types, Linear list – singly linked list implementation, insertion, deletion and searching operations on linear list, circular linked list implementation, Doubly linked list implementation, insertion, deletion and searching operations. Applications of linked lists.

UNIT - II:

Stacks-Operations, array and linked representations of stacks, stack applications-infix to postfix conversion, postfix expression evaluation, recursion implementation. Queues-operations, array and linked representations. Circular Queue operations, Dequeue, applications of queue

UNIT - III:

Trees – Definitions, Binary tree representation, Binary search tree, binary tree traversals, AVL tree – operations, B-tree – operations, B+ trees, Red Black tree.

UNIT - IV:

Graphs: Terminology, sequential and linked representation, graph traversals : Depth First Search & Breadth First Search implementation. Spanning trees, Prims and Kruskals method.

UNIT - V:

Searching and Sorting – Big O Notation, Sorting- selection sort, bubble sort, insertion sort, quick sort, merge sort, Searching-linear and binary search methods.

Text Books:

1. **Data Structures Using C** Reema Thareja, Oxford University Press, 2011 Learning.
2. **Data Structures Using C** (Paperback) by Aaron M. Tenenbaum

Reference Books:

1. **C Programming & Data Structures**, B.A.Forouzan and R.F. Gilberg, Third Edition, Cengage
2. **C& Data structures** – P. Padmanabham, Third Edition, B.S. Publications.
3. **Data Structures using C** – A.M.Tanenbaum, Y.Langsam, and M.J. Augenstein, Pearson Education

Course Outcomes:

The student will be able to:

1. Analyze algorithms and algorithm correctness.
2. Apply searching and sorting techniques.
3. Practice stack, queue and linked list operation.
4. Relate tree and graphs concepts.
5. Relates graphs concepts with traversals.

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B.Tech	**L**	**T-P-D**	**C**
III Year I Semester	**3**	**0-0-0**	**3**

PYTHON PROGRAMMING
(Open Elective-I)

Course objectives:
Student will:

1. Learn how to design and program Python applications.
2. Learn how to use lists, tuples, and dictionaries in Python programs.
3. Learn how to identify Python object types, Components ,decision statements, pass arguments in Python.
4. Learn how to build and package Python modules for reusability, design object oriented programs with Python classes,use class inheritance in Python for reusability.
5. Learn how to use exception handling in Python applications for error handling

UNIT - I:
Programming paradigms; Structured programming vs object oriented programming, OOPs fundamentals- class, object, abstraction, encapsulation, polymorphism, and inheritance; Introduction to Python Getting started to Python- an interpreted high level language, interactive mode and script mode. Variables, Expressions and Statements Values and types, Variables and keywords, statements, evaluating expressions, operators and operands, order of operations, composition. Functions function calls, type conversion, type coercion, pre-defined functions, composition, user define functions, flow of execution, passing parameters, function parameters and scope. Conditionals and recursion modulus operator, Boolean expression, logical operators, conditional execution, alternative execution, chained and nested conditionals, return statement; Recursion, infinite recursion.

UNIT - II:
Python data structures Strings Creating, initializing and accessing the elements; String operators, comparing strings using relational operators; String functions and methods. **Lists:** Concept of mutable lists, creating, initializing and accessing the elements, traversing, appending, updating and deleting elements; List operations; List functions and Methods, list parameters, nested lists, Matrices.

Dictionaries
Concept of key-value pair, creating, initializing and accessing the elements in a dictionary, dictionary operations traversing, appending, updating and deleting elements, Dictionary functions and methods.

Tuples
Mutability and tuples, Immutable concept, creating, initializing and accessing the elements in a tuple, Tuple functions.

UNIT - III:

Object oriented programming using Python: creating python classes, classes and objects: user defined compound types, attributes, instances as arguments, instances as return values, objects are mutable, copying; classes and functions: pure function, modifiers; Exceptions: raising exceptions, handling exceptions, exception hierarchy.

UNIT - IV:

Classes and methods: object oriented features, optional arguments, initialization method, operator overloading and polymorphism. Inheritance: Basic Inheritance: extending built-ins, overriding and super; Multiple inheritance: the diamond problem, different sets of arguments.

UNIT - V:

Files handling and Exceptions: Text files, writing variables, Directories, Pickling;
Database Programming in Python: Connection module, connect MySQL Data base, perform DDL, DML and DQL operations.

Text Books:

1. **Python 3 Object Oriented Programming,** Dusty Phillips, Packet Publishing, 2010.
2. **Programming in Python 3** - A complete Introduction to the Python Language- Second Edition, Mark Summerfiels, Addison-Wesley 2010.

Reference Books:

1. **Programming Python- 4th Edition**, Mark Lutz, O'Reilly, 2011.
2. **Object-Oriented Programming in Python**, Michael H, Goldwasser, David Letscher, Pearson Prentice Hall, 2008.

Course outcomes:

Students will abel to:

1. Describe to design and program Python applications.
2. Analyze and conversion of to use lists, tuples, and dictionaries in Python programs.
3. Explain the concept to identify Python object types, Components ,decision statements, pass arguments in Python.
4. Apply decision for building and package Python modules for reusability, design object-oriented programs with Python classes, use class inheritance in Python for reusability.

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III Year - I Semester	**3**	**0-0-0**	**3**

E-DISASTER MANAGEMENT

(OPEN ELECTIVE-I**)**

Course Objectives

At the end of the course, students will :

1. Explain various disasters and their impacts.
2. Describe storage networking technologies such as FC-SAN, NAS, IP-SAN and data archival solution – CAS.
3. Identify different storage virtualization technologies and their benefits.
4. Understand and articulate business continuity solutions including, backup technologies, and local and remote replication.
5. Identify parameters of managing and monitoring storage infrastructure and describe common storage management activities and solutions.

UNIT-I:

Introduction to Disasters; Examples; Information Availability, Causes of Information Unavailability, Measuring Information Availability.

Consequences of Downtime; Failure Analysis, Single Point of Failure, Fault Tolerance, Multi pathing Software.

UNIT-II:

Backup and Recovery: Backup Purpose, Backup Considerations, Backup Granularity, Recovery Considerations.

Backup Methods, Backup Process Backup and Restore Operations, Backup Topologies, Backup in NAS Environments, Backup Technologies.

UNIT-III:

Local Replication: Source and Target, Uses of Local Replica, Data Consistency, Local Replication Technologies, Restore and Restart Considerations Creating Multiple Replicas, Management. Interface.

Remote Replication: Modes of Remote Replication, Remote Replication Technologies Network Infrastructure.

UNIT-IV:

Securing the Storage Infrastructure, Storage Security Framework, Risk Triad, Assets, Threats, Vulnerability. Storage Security Domains, Securing the Application Access Domain. Securing the Management Access Domain, Securing Backup, Recovery, and Archive (BURA), Security Implementations in Storage Networking SAN , NAS, IP SAN.

UNIT-V:

Monitoring the Storage Infrastructure: Parameters Monitored, Components Monitored, Monitoring Examples, Alerts, Storage Management Activities, Availability management, Capacity management, Performance management, Security Management.

Reporting, Storage Management Examples, Storage Infrastructure Management Challenges, Developing an Ideal, Solution, Storage Management Initiative, Enterprise Management Platforms.

TEXT BOOK:

1. Information Storage and Management: Storing, Managing, and Protecting Digital Information**,** Ganesh Rajaratnam**,** EMC Education Services. Wiley Publications.
2. Executive Guide to Preventing Information Technology Disasters By Richard Ennals. Springer.

REFERENCE BOOKS:

1. Information Management & Computer Security, Port Elizabeth Technikon, Port Elizabeth, MCB UPLtd.
2. Information Security Management Systems, GodesbergerAllee,BSI.

Course Outcomes

At the end of the course , students will be able to:

1. Apply important storage technologies and their features such as availability,replication, scalability andperformance.
2. Show employs project teams to install, administer and upgrade popularstorage solutions.
3. Illustrate virtual servers and storage between remotelocations.
4. Use the knowledge of Disaster ManagementPhases.

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HUMAN COMPUTER INTERACTION

(OPEN ELECTIVE-I)

Course Objectives

At the end of the course , students will :

1. Demonstrate an understanding of guidelines, principles, and theories influencing human computer interaction.
2. Recognize how a computer system may be modified to include human diversity.
3. Select an effective style for a specific application.
4. Design mock ups and carry out user and expert evaluation of interfaces

UNIT I

Introduction: Importance of user Interface – definition, importance of good design. Benefits of good design. A brief history of Screen design, The graphical user interface – popularity of graphics, the concept of direct manipulation, graphical system, Characteristics, Web user – Interface popularity, characteristics- Principles of user interface.

UNIT II

Design process – Human interaction with computers, importance of human characteristics human consideration, Human interaction speeds, understanding business junctions.

UNIT III

Screen Designing: - Design goals – Screen planning and purpose, organizing screen elements, ordering of screen data and content – screen navigation and flow – Visually pleasing composition – amount of information – focus and emphasis – presentation information simply and meaningfully – information retrieval on web – statistical graphics – Technological consideration in interface design.

UNIT IV

Windows – New and Navigation schemes selection of window, selection of devices based and screen based controls Components – text and messages, Icons and increases – Multimedia,
colors, uses problems, choosing colors.

UNIT V

Software tools – Specification methods, interface – Building Tools. Interaction Devices – Keyboard and function keys – pointing devices – speech recognition digitization and generation – image and video displays – drivers.

TEXT BOOK:

1. The essential guide to user interface design, Wilbert O Galitz, WileyDreamTech.
2. Designing the user interface. 3rd Edition Ben Shneidermann , Pearson EducationAsia

REFERENCE BOOKS:

1. Human – Computer Interaction. Alan Dix, Janet Fincay, GreGoryd, Abowd, RussellBealg,PearsonEducation
2. Interaction Design Prece, Rogers, Sharps. WileyDreamtech.
3. User Interface Design, Soren Lauesen , PearsonEducation.
4. Human –Computer Interaction,D.R.Olsen,Cengage Learning.

Course Outcomes

At the end of the course , students will be able to:

1. Explain the human, Computer components functions regarding interaction with computer
2. Demonstrate Understanding of Interaction between the human and computer Components.
3. Use Paradigms, HCI in the software process.
4. Implement Interaction design basics**.**

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III Year - I Semester	**3**	**0-0-0**	**3**

INTRODUCTION TO MICROPROCESSORS AND MICROCONTROLLERS

(OPEN ELECTIVE-I)

Course Objectives:
At the end of the course, students will learn:

1. Study the Architecture of 8085&8086 microprocessor
2. Learn the design aspects of I/O and Memory Interfacing circuits.
3. Study the Architecture of 8051 microcontroller
4. Make the interfacing in between microprocessor and various peripherals.
5. Know basic feature of 8051 and AVR controller.

UNIT–I:

8086 Architecture:8086 Architecture Functional diagrams, Register organization, memory segmentation, programming model, memory addresses, physical memory organization, architecture of 8086,signal descriptions of 8086-common function signals, Timing diagrams, interrupts of 8086.

UNIT–II:

Instruction set and assembly language programming of 8086: Instruction formats, addressing modes, instruction set, assembler directives, macros, simple programs involving logical, branch and call instructions, sorting, evaluating arithmetic expressions, string manipulations.

UNIT–III:

I/O Interface: 8255 PPI, Various modes of operation and interfacing to 8086, interfacing keyboard, Display, D/A and A/D converter.
Interfacing with advanced devices: memory interfacing to 8086, interrupt structure of 8086, vector interrupt table, interrupt service routine.
Communication interface: serial communication standards, serial data transfer schemes, 8251 USART architecture and interfacing.

UNIT–IV:

Introduction to Microcontrollers: overview of 8051 microcontroller, architecture, I/O ports, memory organization, addressing modes and instruction set of 8051, simple programs.

UNIT-V:

8051 Real Time control: programming time interrupts, programming external hardware interrupts, Programming the serial communication interrupts, programming 8051 Timers and counters.

Text Books:

1. D.V.Hall, Microprocessors and interfacing,TMGH,2nd Edition 2006.
2. Kenneth.J.Ayala, The8051Microcontroler,3rdEd., C engage Learning.

References:

1. Advanced Microprocessors and Peripherals-A. K. Rayand K.M Bhurchandi, TMH, 2nd Edition 2006.
2. The 8051Microcontrollers.Architecture and programming and applications-K.Uma Rao, Andhe Pallavi,Pearson, 2009.
3. Microcomputer system 8086/8088 family architecture. Programming and design-Du and GA Gibson, PHI 2nd Edition.

Course Outcomes:

At the end of the course, students will be able to:

1. Design and implement programs on 8085 microprocessors.
2. Design and implement programs on 8086 microprocessors.
3. Design interfacing circuits with 8086.
4. Design and implement 8051 microcontroller based systems
5. Understand the concepts related to I/O and memory interfacing

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III Year - I Semester	**3**	**0-0-0**	**3**

INTERNET OF THINGS
(OPEN ELECTIVE – I)

Course Objectives:

At the end of the course, students will learn:

1. Explore the interconnection and integration of the physical world and the cyberspace.
2. Able to design and develop IOT Device.
3. Explore the terminology, technology and its applications
4. Understand the concept of M2M (machine to machine) with necessary protocols.
5. To introduce the Python Scripting Language which is used in many IoT devices

UNIT–I:

Introduction to Internet of Things –Definition and Characteristics of IoT, Physical Design of IoT – IoT Protocols, IoT communication models, IoT Communication APIs IoT enabaled Technologies – Wireless Sensor Networks, Cloud Computing, Big data analytics, Communication protocols, Embedded Systems, IoT Levels and Templates.

UNIT–II:

Domain Specific IoT – Home, City, Environment, Energy, Retail, Logistics, Agriculture, Industry, health and Lifestyle

IoT and M2M –Difference between IoT and M2M, SDN, NFV, Difference between SDN and NFV.

UNIT–III:

Basics of IoT System Management with NETCOZF, YANG- NETCONF, YANG, SNMP NETOPEER.

UNIT–IV:

Network & Communication aspects

Wireless medium access issues, MAC protocol survey, Survey routing protocols, Sensor deployment & Node discovery, Data aggregation & dissemination

UNIT-V:

Challenges in IoT

Design challenges, Development challenges, Security challenges, other challenges

Domain specific applications of IoT

Home automation, Industry applications, Surveillance applications, Other IoT applications

Text Books:

1. Internet of Things – A Hands-on Approach, Arshdeep Bahga and Vijay Madisetti, Universities Press, 2015, ISBN: 9788173719547

Course Outcomes:

At the end of the course, students will be able to:

1. Understand the application areas of IOT
2. Realize the revolution of Internet in Mobile Devices, Cloud & Sensor Networks.
3. Building blocks of Internet of Things and characteristics.
4. Design and implementation/modification of methods involved in IoT.
5. Describe what IoT is and the skill sets needed to be a network analysis.

Open Elective - II

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III Year - II Semester	**3**	**0-0-0**	**3**

ESTIMATION, QUANTITY SURVEY & VALUATION
(Open Elective-II)

Course Objective

The main objective of the course is to

1. Understand how to estimate the quantities of work, develop the bill of quantities and arrive at the Cost of civil engineering Project
2. Estimate the detailed quantities of various items of work and their rates in building projects.
3. Estimate the quantities of works and evaluate cost of project.
4. Understand and apply the concept of Valuation for Properties
5. Understand, Apply and Create the Tender and Contract document.

UNIT - I:

General items of work in Building – Standard Units Principles of working out quantities for detailed and abstract estimates – Approximate method of Estimating

UNIT II:

Detailed Estimates of Buildings - Reinforcement bar bending and bar requirement schedules

UNIT - III:

Earthwork for roads and canals.

UNIT - IV:

Rate Analysis – Working out data for various items of work over head and contingent charges.

UNIT - V:

Contracts – Types of contracts – Contract Documents – Conditions of contract, Valuation - Standard specifications for different items of building construction.

Text Books:

1. Estimating and Costing by B.N. Dutta, UBS publishers, 2000.
2. Estimating and Costing by G.S. Birdie.

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B.Tech.	**L**	**T-P-D**	**C**
III Year - II Semester	**3**	**0-0-0**	**3**

WASTE MANAGEMENT
(Open Elective-II)

Course Objectives:

1. To learn about Solid Waste management
2. To describe the collection, treatment and disposal methods of Solid waste

UNIT - I:

Introduction

Definition of solid waste, garbage, rubbish-Sources and Types of solid wastes Municipal waste, industrial waste, plastic waste, electronic waste, bio-medical waste and hazardous waste - Characteristics of Solid Wastes: Physical, chemical and biological characteristics-Problems due to improper disposal of solid waste.

UNIT II:

Functional Elements of Solid Waste Management

Waste generation and handling at source-onsite storage-Collection of solid wastes Collection methods and services-storage of solid waste- guidelines for collection route layout.

UNIT - III: Transfer and Transport of Wastes

Transfer station-types of vehicles used for transportation of solid Waste-Processing and segregation of the solid waste- various methods of material segregation.

Processing and Transformation of Solid Wastes

Recycling and recovery principles of waste management- Composting: definition methods of composting-advantages of composting- Incineration: definition methods of incineration advantages and disadvantages of incineration.

UNIT - IV: Treatment and Disposal of Solid Waste

Volume reduction, Open dumping, land filling techniques, Landfills: classification Design and Operation of landfills, Land Farming, Deep well injection.

UNIT - V: Waste Minimization

Introduction to waste minimization, waste minimization techniques-5R (refuse, reduce, reuse, recover, recycle), municipal waste minimization, industrial waste minimization.

Text Books:

1. Solid and hazardous waste management by M.N.Rao and Razia sultana, BS publications
2. Environmental Engineering by Howard S.Peavy, Donald R.Rowe and George Tchobanognous

Reference Books:

1. Integrated Solid Waste Management by Tchobanognous.
2. Environmental engineering by Y.Anjaneyulu, B.S publication.
3. Environmental Pollution Control Engineering by C.S. Rao; Wiley Eastern Ltd., New Delhi.
4. Environmental engineering by Gerad Kiley, Tata Mc Graw Hill

Course Outcomes:

Students will be able to

1. Identify the types and sources of solid waste, and its characteristics.
2. Employ the treatment and disposal methods of solid waste.
3. Apply the concepts of solid waste management.

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III Year – II Semester	**3**	**0-0-0**	**3**

NON-CONVENTIONAL ENERGY SOURCES AND APPLICATIONS

(Open Elective - II)

UNIT-I:

Introduction: Limitations of conventional energy sources, need and growth of alternate energy sources, basic schemes and applications of direct energy conversion.

MHD Generators: Basic principles and Hall Effect, generator and motor effect, different types of MHD generators, conversion effectiveness. Practical MHD generators, applications and economic aspects.

UNIT-II:

Solar Energy: Photovoltaic effect, characteristics of photovoltaic cells, conversion efficiency, solar batteries and applications. Solar energy in India, solar collectors, solar furnaces & applications.

UNIT-III:

Thermo-electric Generators: See back effect, peltier effect, Thomson effect, thermoelectric convertors, brief description of the construction of thermoelectric generators, applications and economic aspects.

Fuel Cells: Principle of action, gibbs free energy, general description of fuel cells, types, construction, operational characteristics and applications.

UNIT-IV:

Miscellaneous Sources: Geothermal system, characteristics of geothermal resources, choice of generators, electric equipment and precautions. Low head hydro plants, definition of lowhead hydro power, choice of site and turbines. Tidal energy, idea of tidal energy, tidal electric generator, limitations.

UNIT-V:

8051 Real Time control:

Programming time interrupts, programming external hardware interrupts, and programming the serial communication interrupts, programming 8051 Timers and counters.

Text Books:

1 D.S.Chauhan, „Non Conventional Energy Resources" New Age Publication

2. G.D. Rai, „Non-conventional energy sources", Khanna Publishers

Reference Books:

1. B.H.Khan, „Non Conventional Energy Resources" TMH.
2. H.P.Garg and Jai Prakash, „Solar Energy Fundamentals and Applications", TMH

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Electrical Technology
(Open Elective - II)

UNIT - I:
D.C Generators and DC Motors:
Principle of operation of DC Machines- EMF equation – Types of generators – Magnetization and load characteristics of DC generators, DC Motors – Types of DC Motors – Characteristics of DC motors – 3-point starters for DC shunt motor – Losses and efficiency – Swinburne's test – Speed control of DC shunt motor – Flux and Armature voltage control methods.

UNIT - II:
Transformers & Performance:
Principle of operation of single phase transformer – types – Constructional features – Phasor diagram on No Load and Load – Equivalent circuit, Losses and Efficiency of transformer and Regulation – OC and SC tests – Predetermination of efficiency and regulation (Simple Problems).

UNIT - III:
Three Phase Induction Motor:
Principle of operation of three-phase induction motors –Slip ring and Squirrel cage motors – Slip-Torque characteristics – Efficiency calculation – Starting methods.

UNIT - IV:
Alternators:
Alternators – Constructional features – Principle of operation – Types - EMF Equation – Distribution and Coil span factors – Predetermination of regulation by Synchronous Impedance Method – OC and SC tests.

UNIT - V:
Special Motors & Electrical Instruments:
Principle of operation - Shaded pole motors – Capacitor motors, AC servomotor, AC tachometers, Synchros, Stepper Motors – Characteristics, Basic Principles of indicating instruments – Moving Coil and Moving iron Instruments (Ammeters and Voltmeters).

Text Books:

1. Introduction to Electrical Engineering – M.S Naidu and S. Kamakshaiah, TMH Publ.
2. Basic Electrical Engineering - T.K. Nagasarkar and M. S. Sukhija, Oxford University Press, 2005

Reference Books:

1. Principles of Electrical Engineering - V.K Mehta, S. Chand Publications.
2. Theory and Problems of basic electrical engineering - I.J. Nagarath and D.P Kothari, PHI Publications
3. Essentials of Electrical and Computer Engineering - David V. Kerns, JR. J. David Irwin

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OPERATIONS RESEARCH
(Open Elective-II)

UNIT I: Introduction - Development – Definition– Characteristics and Phases – Types of models – Operations Research models – applications.
ALLOCATION: Linear Programming Problem - Formulation – Graphical solution – Simplex method – Artificial variables techniques: Two–phase method, Big-M method; Duality Principle.

UNIT II: TRANSPORTATION PROBLEM – Formulation – Optimal solution, unbalanced transportation problem – Degeneracy.
Assignment problem – Formulation – Optimal solution - Variants of Assignment Problem; Traveling Salesman problem.

UNIT III: SEQUENCING – Introduction – Flow **–**Shop sequencing – n jobs through two machines – n jobs through three machines – Job shop sequencing – two jobs through 'm' machines
REPLACEMENT: Introduction – Replacement of items that deteriorate with time – when money value is not counted and counted – Replacement of items that fail completely-Group Replacement.
UNIT IV: THEORY OF GAMES: Introduction –Terminology– Solution of games with saddle points and without saddle points- 2 x 2 games –m x 2 & 2 x n games - graphical method – m x n games - dominance principle.
INVENTORY: Introduction – Single item, Deterministic models – Types - Purchase inventory models with one price break and multiple price breaks – inventory models with and without shortage cost. Stochastic models – demand discrete variable or continuous variable – Single Period model with no setup cost.

UNIT V: WAITING LINES: Introduction – Terminology-Single Channel – Poisson arrivals and Exponential Service times – with infinite population and finite population models– Multichannel – Poisson arrivals and exponential service times with infinite population.
DYNAMIC PROGRAMMING:
Introduction – Terminology- Bellman's Principle of Optimality – Applications of dynamic programming- shortest path problem – linear programming problem.
SIMULATION:- Definition – types of simulation models- applications ,advantages and disadvantage. Brief introduction of simulation languages – inventory and queuing problems using random numbers

TEXT BOOKS :

1. Operation Research /J.K.Sharma/MacMilan.
2. Operations Research / ACS Kumar/ Yesdee

REFERENCES:

1. Operations Research: Methods and Problems / Maurice Saseini, Arhur Yaspan and Lawrence Friedman
2. Operations Research /A.M.Natarajan, P. Balasubramaniam, A. Tamilarasi/Pearson Education
3. Operations Research / Wagner/ PHI Publications.
4. Introduction to O.R/Hillier & Libermann (TMH).

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NANOTECHNOLOGY

(Open Elective **–II)**

UNIT I: Introduction to nanotechnology: Importance of nano scale, Nanostructure types, electronic, magnetic, optical Properties of Nano materials, top-down and bottom- up approach to nanostructures.

Quantum Mechanical phenomenon in nanostructures: Quantum confinement of electrons in semiconductor Nano structures, one dimensional confinement (Quantum wires), two dimensional confinements (Quantum Wells), three dimensional confinements (Quantum dots).

UNIT II: Carbon Nano Structures: Carbon nano tubes (CNTs), Fullerenes, C60, C80 and C240 Nanostructures, Properties (mechanical, optical and electrical) and applications.

Fabrication of Nano materials: Physical Methods: Inert gas condensation, Arc discharge, RF plasma, Plasma arc technique, Ion sputtering, Laser ablation, Laser pyrolysis, Molecular beam epitaxy, Chemical vapour deposition method.

UNIT III: Nano scale characterization techniques: Scanning probe techniques (AFM, MFM, STM, SEM, TEM), XRD

Nano devices and Nano medicine: Lab on chip for bioanalysis, Core/shell Nanoparticles in drug delivery systems (site specific and targeted drug delivery), cancer treatment, and bone tissue treatment.

UNIT IV: Nano and molecular electronics: Resonant-Tunneling structures, single electron tunneling, Single Electron transistors, coulomb blockade, giant magneto resistance, tunneling magneto resistance.

UNIT V: Nanolithography and Nano manipulation: e-beam lithography and SEM based nanolithography and nano manipulation, Ion beam lithography, oxidation and metallization. Mask and its application. Deep UV lithography, X-ray based lithography.

TEXT BOOKS :

1. Introduction to Nanotechnology: Charles.P.Pode, Springer Publications, 2008.
2. Springer Handbook of Nanotechnology: Bharat Bhusan, Springer Publications, 2010.

REFERENCES:

1. Principles of Nanotechnology: Phani Kumar, Scitech Publications.
2. Transport in Nano structures: David Ferry, Cambridge University Press 2000
3. Nano-biotechnology; C.M. Niemeyer, C.A. Mirkin, Wiley Publications, 2006.

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APPLICATIONS OF MICROPROCESSORS AND CONTROLLERS

(Open elective-II)

Course Objectives: The Student will

1. understand the control systems and types of control systems
2. understand the basic 16-bit microprocessor architecture and its functionalities and develop microprocessor basic programs for various applications.
3. develop the microcontroller based programs for various applications.
4. understand basic feature of 8051 controller.
5. understand the basics of PLC and SCADA and their functionalities.

Unit I: Introduction: Control Systems Components Role of control system in instrumentation, Open and close loop control system, types and Block diagram, Servomechanism and regulators with suitable examples, Basic control actions - On-off, Proportional, Derivative, Integral control, Proportional derivative (PD).

Proportional integral (PI), P Proportional integral and Derivative (PID) control, Basic control system components –AC/ DC Servo motor, AC/ DC Tacho generator, Stepper motor and Synchronous motor.

Unit II: Basics of Microprocessor

Introduction to microprocessor, Advantages and disadvantages of microprocessor control, Structure of microprocessor, Generalized architecture of microprocessor, Functions of each block, Functional block diagram of 8085 microprocessors with pin diagram, logical block diagram of 8085 Microprocessor-Registers.

ALU, memory organization, decoder, serial control section, interrupt section, timing and control section, Assembly language Programming of 8085, Addressing Modes, Instruction classification, Instruction formats, Basic Assembly Language programming (only simple arithmetic operations-addition, subtraction).

Unit III: Basics of Microcontroller 8051

Micro controllers and microprocessors, Pin diagram of 8051 microcontrollers, Internal RAM, ROM and Special function registers in 8051chip, I/O ports.

Counters and Timers, interfacing with external memory I/O ports, Counters and Timers, Interfacing with external memory.

Unit IV: Microprocessor and Microcontroller Applications

Different types of memories: ROM, RAM, PROM, EPROM, EEPROM, Schematic diagram of memory chips decoder, memory interfacing., Memory I/O data transfer scheme for 8255.

Interfacing of switches and LEDs, Simple application ns of microprocessor and Microcontroller for temperature control of furnace, Traffic light control and SCR firing angle control using microprocessor, Data acquisition system.

Unit V: Programmable Logic Controller and SCADA

PLC: CPU, I/O modules, bus system, power supplies and remote I/Os, counter, timer, Different PLC's available in market, Selection of a PLC, SCADA- Concept and Application.

TEXT BOOKS:

1. Control Systems Engineering, Nagarath I. J., Gopal M., New Age Publishers, New Delhi.
2. Microprocessor Architecture, Programming and Applications with 8085, Gaonkar, Ramesh S., Penram International Publishing (India) Pvt. Ltd.
3. The 8051 Microcontroller Architecture, Programming and Applications, Ayala, Kenneth J., Penram International Publishing (I) Pvt. Ltd.
4. Programmable Logic Controllers And Applications, Webb, John W Ronald Reis. A., Prentice Hall of India, New Delhi.

REFERENCE BOOKS:

1. Fundamentals of Microprocessors and Microcontrollers, Ram, B., Dhanpat Rai Publications, New Delhi.
2. Microprocessors and Interfacing Programming and Hardware, Hall, Douglass V., TMH publication, New Delhi.
3. The 8051 Microcontroller and Embedded Systems using Assembly and C, Ali, Muhamad Mazidi, Janice Mazidi Gillispie, Roli, PHI Learning, New Delhi.

Course Outcomes: The Student will be able to

1. design the different types of control systems and to full fill the desired specifications.
2. analyze 8085 microprocessors architectures and its functionalities and real time applications using programming languages like Assembly Language and MASM.
3. explain the basics of 8051 microcontroller's architecture and its functionalities.
4. design microcontroller based projects for real time applications.
5. analyze PLC and SCADA and their functionalities.

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FUNDAMENTALS OF HDL

(Open Elective-II)

Course Objectives: Students will

1. learn the fundamental of HDL language.
2. get the Knowledge about different levels of abstract.
3. construct Procedures, Tasks, and Functions using language.
4. write the programs in Mixed –Language Descriptions
5. define Synthesis and mapping of digital design

Unit I: Introduction: Why HDL?, A Brief History of HDL, Structure of HDL Module, Operators, Data types, Types of Descriptions, simulation and synthesis, Brief comparison of VHDL and Verilog.
Data –Flow Descriptions: Highlights of Data-Flow Descriptions, Structure of Data-Flow Description, Data Type – Vectors.

Unit II: Behavioral Descriptions
Behavioral Description highlights, structure of HDL behavioral Description, The VHDL variable –Assignment Statement, sequential statements.
Structural Descriptions: Highlights of structural Description, Organization of the structural Descriptions, Binding, state Machines, Generate, Generic, and Parameter statements.

Unit III: Procedures, Tasks, and Functions
Highlights of Procedures, tasks, and Functions, Procedures and tasks, Functions. Advanced HDL Descriptions: File Processing, Examples of File Processing.
Mixed –Type Descriptions: Why Mixed-Type Description? VHDL User-Defined Types, VHDL Packages, Mixed-Type Description examples.

Unit IV: Mixed –Language Descriptions
Highlights of Mixed-Language Description, How to invoke One language from the Other.
Mixed-language Description Examples, Limitations of Mixed-Language Description.

Unit V: Synthesis Basics
Highlights of Synthesis, Synthesis information from Entity and Module.
Mapping Process and Always in the Hardware Domain.

TEXT BOOKS:
1. HDL Programming (VHDL and Verilog)- Nazeih M.Botros- John Weily India Pvt. Ltd. 2008.

REFERENCE BOOKS:
1. Fundamentals of HDL – Cyril P.R. Pearson/Sanguin 2010.
2. VHDL -Douglas perry-Tata McGraw-Hill.

3. A Verilog HDL Primer- J.Bhaskar – BS Publications.
4. Circuit Design with VHDL-Volnei A.Pedroni-PHI.

Course Outcomes: Students will be able to

1. understand the fundamental of HDL language.
2. analyze different levels of abstract.
3. create Procedures, Tasks, and Functions.
4. implement tasks in Mixed –Language Descriptions.
5. evaluate Synthesis and mapping of digital design.

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DATABASE MANAGEMENT SYSTEMS
(Open Elective-II)

Course Objectives:
The Student will:

1. Understanding of the architecture and functioning of database management systems as well as associated tools and techniques.
2. Understand and apply the principles of data modeling using entity relationship and develop a good database design.
3. Understand the use of structured query language (SQL) and its syntax.
4. Apply normalization techniques to normalize a database.
5. Understand the need of database processing and learn techniques for controlling the consequences of concurrent data access.

UNIT - I:

Data base System Applications, data base System VS file System – View of Data – Data Abstraction –Instances and Schemas – data Models – the ER Model – Relational Model – Other Models – Database Languages – DDL – DML – database Access for applications Programs – data base Users and Administrator – Transaction Management – data base System Structure – Storage Manager – the Query Processor

ER diagrams – Beyond ER Design Entities, Attributes and Entity sets – Relationships and Relationship sets – Additional features of ER Model – Concept Design with the ER Model

UNIT - II:

Introduction to the Relational Model

-Integrity Constraint Over relations – Enforcing Integrity constraints – Querying relational data – Logical data base Design – Introduction to Views – Destroying /altering Tables and Views.

Relational Algebra

-Selection and projection set operations – renaming – Joins – Division – Examples of Algebra overviews – Relational calculus – Tuple relational Calculus – Domain relational calculus – Expressive Power of Algebra and calculus.

UNIT - III:

Form of Basic SQL Query

-Examples of Basic SQL Queries – Introduction to Nested Queries – Correlated Nested Queries Set – Comparison Operators – Aggregative Operators – NULL values – Comparison using Null values – Logical connectivity‟s – AND, OR and NOT – Impact on SQL Constructs – Outer Joins – Disallowing NULL values – Complex Integrity Constraints in SQL Triggers and Active Data bases.

Schema refinement

-Problems Caused by redundancy – Decompositions – Problem related to decomposition – reasoning about FDS – FIRST, SECOND, THIRD Normal forms – BCNF – Lossless join Decomposition – Dependency preserving Decomposition – Schema refinement in Data base Design – Multi valued Dependencies – FORTH Normal Form.

UNIT - IV:

Transaction Concept

-Transaction State- Implementation of Atomicity and Durability – Concurrent – Executions – Serializability- Recoverability– Implementation of Isolation – Testing for serializability- Lock – Based Protocols – Timestamp Based Protocols- Validation- Based Protocols – Multiple Granularity.

Recovery and Atomicity

-Log – Based Recovery – Recovery with Concurrent Transactions – Buffer Management – Failure with loss of nonvolatile storage-Advance Recovery systems- Remote Backup systems.

UNIT - V:

Data on External Storage

-File Organization and Indexing – Cluster Indexes, Primary and Secondary Indexes – Index data Structures – Hash Based Indexing – Tree base Indexing – Comparison of File Organizations – Indexes and Performance Tuning- Intuitions for tree Indexes – Indexed Sequential Access Methods (ISAM) – B+ Trees: A Dynamic Index Structure.

Advanced Database Management System

Introduction to Distributed Database-Reference Architecture, fragmentation, Allocation, Joins

Text Books:

1. **Data Base Management Systems**, Raghurama Krishnan, Johannes Gehrke, TATA McGrawHill 3rd Edition
2. **Data base System Concepts**, Silberschatz, Korth, McGraw hill, V edition.

Reference Books:

1. **Data base Systems design,** Implementation, and Management, Peter Rob & Carlos Coronel 7th Edition.
2. **Fundamentals of Database Systems,** Elmasri Navrate Pearson Education
3. **Introduction to Database Systems,** C.J.Date Pearson Education

Course Outcomes:

The student will be able to:

1. Describe basic concepts of database system.
2. Design a data model and schemas in RDBMS.
3. Use RDBMS for developing industry applications.
4. Be competent in use of structured query language sql.
5. Analyze functional dependencies for designing a robust database

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CLOUD COMPUTING
(Open Elective-II)

Course Objectives:
Student will:

1. Learn about the cloud environment, services and hadoop
2. Classify cloud platforms and virtualization concepts
3. Identify cloud computing applications and enterprise cloud computing paradigms
4. Demonstrate cloud application development using python
5. Explain security concepts in the cloud

UNIT-I:

Principles of Parallel and Distributed Computing, Introduction to cloud computing, Cloud computing Architecture, cloud concepts and technologies, cloud services and platforms, Cloud models, cloud as a service, cloud solutions, cloud offerings, introduction to Hadoop and Mapreduce.

UNIT-II:

Cloud Platforms for Industry, Healthcare and education, Cloud Platforms in the Industry, cloud applications. Virtualization, cloud virtualization technology, deep dive: cloud virtualization,

Migrating in to cloud computing, Virtual Machines Provisioning and Virtual Machine Migration Services, On the Management of Virtual Machines for cloud Infrastructure, Comet cloud, T-Systems

UNIT-III:

Cloud computing Applications: Industry, Health, Education, Scientific Applications, Business and Consumer Applications, Understanding Scientific Applications for Cloud Environments, Impact of Cloud computing on the role of corporate IT.

Enterprise cloud computing Paradigm, Federated cloud computing Architecture, SLA Management in Cloud Computing, Developing the cloud: cloud application Design.

UNIT-IV:

Python Basics, Python for cloud, cloud application development in python, Cloud Application Development in Python.

Programming Google App Engine with Python: A first real cloud Application, Managing Data in the cloud, Google app engine Services for Login Authentication, Optimizing UI and Logic, Making the UI Pretty: Templates and CSS, Getting Interactive. Map Reduce Programming Model and Implementations.

UNIT-V:

Cloud management, Organizational Readiness and change management in the cloud age , Cloud Security, Data security in the cloud, Legal Issues in the Cloud , Achieving Production Readiness for the cloud Services

TEXT BOOKS:

1. Cloud Computing: Raj Kumar Buyya , James Broberg, andrzej Goscinski, 2013 Wiley
2. Mastering Cloud Computing: Raj Kumar buyya, Christian Vecchiola,selvi-2013.

REFERENCE BOOKS:

1. Cloud Computing: Arshdeep Bahga, Vijay Madisetti, 2014, University Press.
2. Cloud computing: Dr Kumar Saurab Wiley India 2011.
3. Code in the Cloud: Mark C.Chu-Carroll 2011, SPD.(Second part of IV UNIT)

Course Outcomes:

Student will able to:

1. Understand about the cloud environment, services and hadoop
2. Differentiate cloud platforms and virtualization concepts
3. Describe cloud computing applications and enterprise cloud computing paradigms
4. Implement cloud application development using python
5. Apply security concepts in the cloud

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E-WASTE MANAGEMENT

(OPEN ELECTIVE-II)

Course Objectives

At the end of the course , students will :

1. Know regarding E-Waste Management in India Global E-Waste Growth
2. Analyze the overview of WEEE.
3. Understanding scenarios for E-Waste management.
4. Visualize the basic concepts of E-Waste Regulation
5. Understand the basic concepts of Recycling technologies.

UNIT – I:

Introduction to e-Waste Management in India Global e-waste growth, Dark shadows of digitization on Indian horizon, e-waste generation, migration, Present practice and systems, disposal methods, Present processing practices, Initiatives to manage e-waste, Strengths and weaknesses of the current system.

UNIT – II:

WEEE (waste electrical and electronic equipment) - toxicity and healthHazardous substances in waste electrical and electronic equipment-toxicity and release, Occupational and environmental health perspectives of e-waste recycling.

UNIT – III:

Options and Scenarios for e-Waste Management Actions to be considered to achieve goals of e- waste management, Collection/ take back system, Closing the Plastic loop: Turning the supplychain into a supply cycle by mining plastics from end-of-life electronics and other durable
goods.

UNIT – IV:

E-waste regulation: E-waste legislation in the European Union and the Basel Convention. Regulating e-waste: a review of the international and national legal framework on e-waste Extended producer responsibility: a key tool for international rules and regulations on e-waste

UNIT – V:

Recycling technologies for e-waste Recycling of e-scrap in a global environment opportunities and challenges. Technologies for recovery of resources from e-waste. Reuse:A Bridge from Unsustainable e-waste to sustainable e-resources.

TEXT BOOKS:

1. Rakesh Johri, E-waste: Implications, regulations, and management inIndia and current global best practices.

2. Klaus Hieronymi, RamzyKahhat, Eric Williams, E-Waste Management: from Waste toResource

REFERENCE BOOKS:

1. Satish Sinha, PritiMahesh,Waste Electrical and Electronic Equipment The EU andIndia.
2. By Ronald E. Hester, Roy M. Harrison , Electronic WasteManagement.

Course Outcomes

At the end of the course , students will be able to:

1. Demonstrate knowledge of E-Waste management.
2. Implementing environmental health perspectives of E-Waste recycling.
3. Achieve goals of E-Waste management.
4. Develop the skills in E-Waste extended producer responsibility.
5. Describe the technologies for recovery of resources from E-Waste.

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INTRODUCTION TO WEB DESIGN

(OPEN ELECTIVE-II**)**

Course Objectives

At the end of the course , students will :

1. Know regarding internet related technologies.
2. Understanding of the current industry support for web technologies.
3. Explain the basic concepts of CSS.
4. Visualize the basic concepts of PHP.
5. Understanding PHP functions and Methods

UNIT-I

Basics in Web Design: Brief History of Internet, What is World Wide Web, Why create a web site, Web Standards, Audience requirement.

Web Design Principles: Basic principles involved in developing a web site, Planning process , Five Golden rules of web designing, Designing navigation bar ,Page design, Home Page Layout, Design Concept.

UNIT-II

Introduction to HTML : What is HTML, HTML Documents, Basic structure of an HTML document, Creating an HTML document, Mark up Tags, Heading-Paragraphs, Line Breaks, HTML Tags, HTML Tables, HTML Forms.

Elements of HTML: Introduction to elements of HTML, Working with Text Working with Lists, Tables and Frames, Working with Hyperlinks, Images and Multimedia, Working with Forms and controls.

UNIT-III

Introduction to Cascading Style Sheets: Concept of CSS, Creating Style Sheet and types of CSS, CSS Properties, CSS Styling(Background, Text Format, Controlling Fonts), Working with block elements and objects, Working with Lists and Tables, CSS Id and Class, Box Model(Introduction, Border properties, Padding Properties, Margin properties).

CSS Advanced (Grouping, Dimension, Display, Positioning, Floating, Align, Pseudo class, Navigation Bar, Image Sprites, Attribute sector), CSS Colors, Creating page Layout and Site Designs.

UNIT-IV

Introduction to PHP: Downloading, installing, configuring PHP, The anatomy of a PHP Page. Basic Security Guidelines, Variables, Data Types, Operators and Expressions, Constants, Flow Control Functions; Switching Flow, Loops.

Code Blocks and Browser Output, Objects, Strings Processing, Form processing, Connecting to database, using cookies, dynamic contents.

UNIT-V

Introduction to Web Publishing or Hosting : Creating the Web Site, Saving the site, Working on the web site, Creating web site structure, Creating Titles for web pages, Themes-Publishing web sites.

TEXT BOOK:

1. Dietel and Dietel : —Internet and World Wide Web - How to Program‖, 5th Edition, PHI/Pearson Education,2011
2. Web Technologies: HTML,CSS, XML,Php BlackBook.

REFERENCE BOOKS:

1. Chris Bates, —Web Programming, building internet applications‖, 2ndEdition, WILEY, Dreamtech,2008.
2. HTML 5 in simple steps Kogent Learning Solutions Inc, DreamtechPress
3. Beginning CSS: Cascading Style Sheets for Web Design Ian Pouncey, ichard York Wiley India.

Course Outcomes:

At the end of the course , students will be able to:

1. Develop the application of the HTML for documentstructure.
2. Develop the skills in analyzing the usable of awebsite.
3. Create dynamic webpage, usingPHP.
4. Using PHP to manipulateFiles.
5. Develop the concept of webpublishing

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INTRODUCTION TO EMBEDDED SYSTEMS

(OPEN ELECTIVE-II)

Course Objectives:
At the end of the course, students will learn:

1. Understand the basic concepts of embedded systems and 8051 microcontrollers.
2. Compare and contrast the basics of assembly programming language.
3. Identify the unique characteristics of real-time systems
4. Analyze the general structure of a real-time system and define the unique design problems and challenges of real-time systems.
5. Acquaint the embedded software development tools and various advanced architectures.

UNIT–I:

Embedded Computing: Introduction, complex systems and microprocessor, the embedded system design process, formalisms for system design, design examples.

UNIT–II:

The 8051 Architecture: Introduction, 8051 micro controller hardware, input/output ports and circuits, external memory, counter and timers, serial data input/output, interrupts.

Basic Assembly Language Programming Concepts: The assembly language programming process, programming tools and techniques, programming the 8051. Data transfer and logical instructions, arithmetic operations, decimal arithmetic, jump and call instructions.

UNIT–III:

Introduction to Real-Time Operating Systems: Tasks and task states, tasks and data, semaphores, and shared data; message queues, mailboxes and pipes, timer functions, events, memory management, interrupt routines in an RTOS environment.

Basic Design Using a Real-Time Operating System: Principles, semaphores and queues, hard real-time scheduling considerations, saving memory and power, an example RTOS like uC-OS (open source).

UNIT–IV:

Embedded Software Development Tools: Host and target machines, linker/locators for embedded software, getting embedded software into the target system

Debugging Techniques: Testing on host machine, using laboratory tools, an example system.

UNIT-V:

Introduction to advanced Architectures: ARM and SHARC, processor and memory organization and instruction level parallelism; networked embedded systems: bus protocols, I^2C bus and CAN bus; internet-enabled systems, design example-elevator controller.

Text Books:

1. Wayne Wolf (2008), Computers as Components-principles of embedded computer system design, Elseveir, New Delhi, India.
2. Kenneth J. Ayala (2008), The 8051 Microcontroller, 3rd edition, Cengage Learning, India.

References:

1. David E. Simon (1999), An Embedded Software Primer, Pearson Education, India.
2. Jean J. Labrosse (2000), Embedding System Building Blocks, 2nd edition, CMP publishers, USA.
3. Raj Kamal (2004), Embedded Systems, Tata McGraw hill, India.

Course Outcomes:

At the end of the course, students will be able to:

1. Program an embedded system
2. Analyze Interfacing with keyboard, A/D & D/A conversions, serial data Communication, LCD and LED display.
3. Illustrate Tasks, Semaphores, Message queues, pipes, Timer functions.
4. Design embedded systems and real-time systems
5. Compare and contrast ARM, SHARC, internet enabled systems.

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FUNDAMENTALS OF E-COMMERCE

(OPEN ELECTIVE-II)

Course Objectives:

At the end of the course, students will learn:

1. Identify the major categories and trends of e-commerce applications.
2. Identify the essential processes of an e-commerce system.
3. Identify several factors and web store requirements needed to succeed in e-commerce.
4. Discuss the benefits and trade-offs of various e-commerce clicks and bricks alternatives.
5. Understand the main technologies behind e-commerce systems and how these technologies interact.

UNIT–I:

Introduction: Electronic Commerce Framework, The Anatomy of E-Commerce applications, E-Commerce Consumer applications, E-Commerce organization applications.

UNIT–II:

Consumer Oriented Applications: Mercantile process models, mercantile models from the consumer's perspective, Mercantile from the merchant's perspective.

Types of Electronic Payment Systems, Digital Token-Based Electronic Payment Systems, Smart Cards & Electronic Payment Systems, Credit Card- Based Electronic Payment Systems, Risk & Electronic Payment Systems, Designing Electronic Payment Systems.

UNIT–III:

Electronic Data Interchange: EDI Applications in Business, EDI implementation, MIME, and value added networks.

Intra organizational E-Commerce, Macro forces and Internal Commerce, Work flow automation and Coordination, Customization and Internal Commerce, Supply Chain Management(SCM).

UNIT–IV:

Making a business case for a Document Library, Digital document types, Corporate Data warehouses, Advertising and Marketing, the new age of Information Based Marketing, advertising on Internet, charting the Online marketing process, Market Research.

UNIT-V:

Consumer Search and Resource Discovery, information search and Retrieval, Electronic commerce catalogs or directories, Information Filtering.

Multimedia and Digital video, Key Multimedia concepts, Digital Video & Electronic Commerce, Desktop Video Processing, Desktop Video Conferencing.

Text Books:

1. "Frontiers of electronic commerce" – Kalakota, Whinston, Pearson
2. "E-Commerce", S.Jaiswal – Galgotia

References

1. Ravi Kalakota, Andrew Winston, "Frontiers of Electronic Commerce",Addison-Wesley.
2. Goel, Ritendra "E-commerce", New Age International Laudon, "E-Commerce: Business, Technology, Society", Pearson Education

Course Outcomes:

At the end of the course, students will be able to:

1. Identify the business relationships between the organizations and their customers
2. Perform various transactions like payment, data transfer and etc.
3. Examine some typical distributed applications.
4. Detail some of the problems that are encountered when developing distributed applications.
5. Analyze the technologies that are used to support distributed applications.

Open Elective - III

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ENVIRONMENTAL IMPACT ASSESSMENT
(Open Elective-III)

Course Objectives: The Course objectives of this course are

1. To impart knowledge on Environmental management and environmental impact assessment.
2. To provide a basic understanding of the EIA process as it is used for research, planning, project or program evaluation, monitoring and regulatory enforcement.
3. To outline the impacts on soil, wetlands, flora, fauna, historical structures and the other socioeconomic environment.
4. To introduce students to the legal, economic, social, administrative and technical process preparing and evaluating environmental impact documents.
5. To assess the air and water quality parameters; predict the impacts and their mitigation measures.

UNIT - I:

Basics concepts of EIA: Initial environmental examination, elements of EIA, factors affecting EIA, impact evaluation and analysis, preparation of environmental base map, classification of environmental parameters.

EIA Methodologies: Introduction, Criteria for the selection of EIA methodology, EIA methods, Ad-hoc methods, matrix methods, network method, Environmental Media Quality Index Method (EMQI), Environmental media quality index method, overlay methods, cost/benefit analysis.

UNIT - II:

Impact of developmental activities and land use: Introduction and methodology for the assessment of soil and groundwater, delineation of study area, identification of of activities. Assessment of impact of developmental activities on vegetation and wildlife, environmental impact of deforestation- causes and effects of deforestation.

UNIT - III:

Procurement of relevant soil quality, impact prediction, assessment of impact significance, identification and incorporation of mitigation measures.

EIA of surface water, air and biological environment: Methodology for the assessment of impacts on surface water environment, air pollution sources, generalized approach for assessment of air pollution impact.

UNIT - IV:

Environmental audit and environmental legislation, objectives of environmental audit, types of environmental audit, audit protocel, stages of environmental audit onsite activities, evaluation of audit data and preparation of audit report, post audit activities.

UNIT - V:

Environmental protection Act, The water Act, The air Act (prevention and control of pollution Act), motor act, wild life act. Case studies of preparation of EIAs for various industries.

Text Books:

1. Environmental impact assessment methodologies, by Y.Anjaneyulu, B.S.Publication, Sultan bazaar Hyderabad.
2. Environmental impact assessment, by Alan Gilpin, Cambridge University Press

Reference Books:

1. Environmental pollution Control by Dr. H S Bhatia – Galgotia Publications Pvt Ltd, Delhi.
2. Environmental Impact Assessment and Management Publisher, Daya Author: B Hoisetti, A Kumar

Course Outcomes:

The Students will be able to

1. Explain different methodologies for environmental impact prediction and assessment.
2. Understand the elements of environmental impact assessments and processes by which they apply.
3. Carry out scoping and screening of developmental projects for environmental and social assessments.
4. Evaluate EIA reports.
5. Plan EIAs and environmental management plans

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GREEN BUILDING TECHNOLOGY
(Open Elective-III)

COURSE OBJECTIVES: The objective of this course is to

1. Create awareness about the principles of green building technology and to have insight about the criteria for rating systems along with the established Indian codes and guidelines.
2. Establish a clear understanding of various renewable and non-renewable sources of energy along with their carbon foot prints and enumerates the process of performance testing including building modeling and energy analysis.
3. Discuss about the energy efficient green building materials and to have understanding on the cost-effective Building Technologies, Strategies for Green Building Systems and Energy Conservation Measures.
4. Give details on the principles of sustainable development in green building design.
5. Describe the best green building practices adopted along with cost/benefit and life-cycle analysis of green buildings.

UNIT-I

Concept of Green Buildings: Green building - Definition, Features, Necessity, Initiatives, Green buildings in India, Green building Assessment – Green Building Rating Systems (BREEAM, USGBC, LEED, IGBC, TERI-GRIHA, GREEN STAR), Criteria for rating, Energy efficient criteria, environmental benefits economic benefits, health and social benefits, Major energy efficiency areas for building, Contribution of buildings towards Global Warming. Life cycle cost of buildings, Codes and Certification Programs.

UNIT-II

Sources of Energy:

Renewable and Non-renewable sources of energy - Coal, Petroleum, Nuclear, Wind, Solar, Hydro, Geothermal sources, potential of these sources, hazards, pollution with reference to Global scenario, demand and supply in India, Global efforts to reduce carbon emissions, Performance testing. Building modeling- Energy analysis, Metering, Monitoring.

Carbon emission: Forecasting, Control of carbon emission, Air quality and its monitoring carbon foot print, Environmental issues, Minimizing carbon emission, Energy retrofits and Green Remodels.

UNIT-III

Green Building Materials: Sustainable Materials, Depletion of natural resources for preparation of building materials, renewable and recyclable resources, energy efficient materials, Embodied Energy of Materials. Green cement, Biodegradable materials, Smart materials, Manufactured Materials, Volatile Organic Compounds (Voc's), Natural Non-Petroleum Based Materials, Recycled materials, Renewable and Indigenous Building Materials, Engineering evaluation of these materials.

Green Building Planning and Specifications: Environment friendly and cost effective Building Technologies, Integrated Life cycle design of Materials and Structures, Green Strategies for Building Systems, Alternative Construction Methods, Energy Conservation Measures in Buildings, Waste and Water management and Recycling by Sustainable Facilities, Heating, Ventilation and Air Conditioning, Passive Solar and Daylight, Plumbing and its Effect on Energy Consumption

UNIT-IV

Design of Green Buildings; Sustainable sites, Impact of construction on environment, Life cycle assessment, Principles of sustainable development in Building Design, Design on Bioclimatic and solar passive architecture, Considerations of energy consumption, water use, and system reliability, indoor air quality, noise level, comfort, cost efficiency in building design, Advanced Green building technologies and innovations.

UNIT-V

Construction of Green Buildings: Energy efficient construction, Practices for thermal efficiency and natural lighting. Ecofriendly water proofing; Energy conservation building codes building rating, Maintenance of green buildings, Cost and Performance Comparisons and Benchmarking, Green Project Management Methods and Best Practices, Cost/benefit analysis of green buildings, Life-cycle analysis of green buildings, Case studies of rated buildings (new and existing)

TEXT BOOKS:

1. Alternative Building Materials and Technologies – By K S Jagadeesh, B V Venkata Rama Reddy & K S Nanjunda Rao – New Age International Publishers
2. Integrated Life Cycle Design of Structures – By AskoSarja – SPONPress
3. Non-conventional Energy Resources – By D S Chauhan and S K Sreevasthava – New Age International Publishers
4. Green Buildings (McGraw hill publication): by Gevorkian

REFERENCE BOOKS:

1. Emerald Architecture: case studies in green buildings, The Magazine of Sustainable Design
2. Understanding Green Building Guidelines: For Students and Young Professionals, Traci Rose Rider, W. W. Norton & Company Publisher.
3. Understanding Green Building Materials, Traci Rose Rider, W. W. Norton & Company Publisher.

List of free reference guides/resources available on the net:

1. IGBC reference guide
2. Free abridged versions of LEED reference guides
3. ECBC latest version
4. US GBC's Reference Material

COURSE OUTCOMES:

After completion of the course the student will be able to

1. Know the underlying principles, history, environmental and economic impacts of green building technology and to identify the criteria for rating systems along with the established Indian codes and guidelines.
2. Identify various Renewable and Non-renewable sources of energy along with their carbon foot prints and comprehend the techniques and benefits of building performance testing such as building modeling and energy analysis, monitoring and metering.
3. Recognize the energy efficient green building materials and explain the cost effective Building Technologies, Strategies for Green Building Systems and Energy Conservation Measures.
4. Identify and compare cost and performance of building materials with recycled components, non-petroleum-based materials, materials with low volatile organic compounds, materials with low embodied energy and salvaged materials and incorporate them into design.
5. Explain the application of design guidelines of Green Building considering the Energy Conservation Measures.

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Materials in Electrical Systems

(Open Elective - III)

UNIT - I:

Materials- Conductors-free electron theory and electron scattering Di electrics Polarization, solid, liquid and gas dielectrics Insulators-Classification, Application in electric devices.

UNIT - II:

Magnetic materials-classification based on orientation of magnetic dipoles, Optoelectronic materials, Semiconductors-simple and compound, Refractory Materials. Solders and contacts, Super conductivity and super conducting materials.

UNIT - III:

Components- Resistors and Capacitors. Display units:-LED, LCD and Monitors. Effect of environment on components.

UNIT - IV:

Processes- Basic processes used in the manufacture of integrated circuits such as Epitaxy, masking, photolithography, diffusion, oxidation, Etching, metallization, Scribing, wire bonding and Encapsulation. Induction and Dielectric heating. Electron beam welding and cutting.

UNIT - V:

Cables- Calculations of capacity of cables, charging current, stress, grading, heating of cables, Construction and characteristics of HV & EHV cable

Text Books:

1. S.O. Kasap, Principles of Electrical Engineering Materials," MGH.
2. Mahajan, Principles of growth and processing of semiconductors," MGH.

References Books:

1. Dhir, Electronic components and Materials Principles manufacturing and Maintenance," TMH.
2. Allison, „Electronic Engineering Materials and Devices," TMH.
3. Ruska N Scot, Microelectronic processing – an introduction to the manufacture of integrated circuits," MGH.
4. Decker, Electrical Engineering Materials," PHI.

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Field Theory and Circuits
(Open Elective - III)

UNIT - I: Field Theory:
Review of Vector Analysis- Coordinate Systems, Vectors, gradient, divergence, curl, Laplacian, divergence theorem, Stoke‟s theorem.

UNIT - II:
Electric and Magnetic fields- Electric fields due to distributed charges configurations line(s) of charges, uniform plane surface and spherical volume charge distributions; behavior of conductors and dielectrics in electrostatic fields, boundary conditions, applications of ampere‟s law and Biot- Savart‟s law; capacitance and inductance calculations for simple configurations; time varying fields – displacement current, Maxwell‟s equations; Laplace‟s and Poisson‟s equations.

UNIT - III: Circuit Theory:
Classification of circuits, sources and signals, standard signals, source transformations. Network topology, graph matrices, formulation and solution of circuit equations based on graph theory using different analysis techniques- circuit, cut set and mixed. Concept of duality.

UNIT - IV:
Network theorems and their applications-Superposition, reciprocity, Thevenin, Norton, Maximum power transfer, Millman, Substitution, Compensation and Tellegan‟s theorem. Analysis of circuits subject to periodic and non-periodic excitations using Fourier series and Laplace transforms.

UNIT - V:
Concept of free and forced response of circuits. Time constants and Transient response under d.c. and a. c. excitation. Analysis of magnetically coupled circuits. Analysis of circuits with dependent sources.

Text Books:

1. N.N. Rao, „Basic Electromagnetic with applications‟, PHI
2. Desoer & Kuh, — Basic Circuit theory‖, McGraw Hill.

References Books:

1. E.C. Jordan and K.G. Balmain, „Electromagnetic waves and radiating systems‟, PHI
2. D.J. Griffith, „Introduction to Electrodynamics‟, PHI .
3. Guru & Hiziroglu, „ Electromagnetic field theory fundamentals‟, Vikas Publishing House
4. Van Valkenberg , —Network Analysis‖, PHI.
5. Valkenberg & Kinariwala , —Linear Circuits‖, PHI.
6. Trick , —Introduction to circuit Analysis‖, Wiley.
7. Roy Choudhary , —Networks & systems‖, Wiley.

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RELIABILITY ENGINEERING

(OPEN ELECTIVE-III)

Course Objectives:

The student will

1 Know the micro systems and its manufacturing techniques.

2 Understand the working of micro sensors and actuators.

3 Design Microsystems

Course Outcomes:

The student will be able to

1 Overview of micro systems and explain the micro manufacturing techniques.

2 Discuss the principles and types of micro sensors and actuators.

3 Understand the fundamentals of micro fluidics and design Microsystems.

UNIT - I

Basics concepts of reliability: Introduction, Reliability and quality, Failures and failure modes, Causes of failures and reliability, Maintainability and availability, History of reliability, reliability literature.

Reliability mathematics: Introduction, Random experiment , Probability , Random variables, Distribution functions, Discrete distribution ,Continuous distribution, Numerical characteristics of random variables , Laplace transform.

UNIT- II

Component reliability and hazard models: Introduction, Component reliability from test data, Mean time to failure, Time – dependent hazard models, Stress- Dependent hazard models, Derivation of reliability function using Markov, Treatment of field data.

System reliability models: Introduction - Systems with component within series - Systems with parallel components - k-out – of- m systems - Non series parallel systems - Systems with - mixed – mode failures - Fault- tree technique

UNIT- III

Maintainability and availability concepts: Introduction - Maintainability function - Availability function - Frequency of failures - Two-unit parallel systems with repair - k-out- of-m systems - Preventive maintenance.

Reliability improvement: Introduction - Improvement components - Redundancy - Element redundancy - Unit redundancy - Stand by redundancy - Optimization - Reliability – cost trade – off.

UNIT- IV

Economics of reliability engineering: Economic issues - Manufacture's cost - Customer's cost - Reliability achievement cost - models - Reliability utility cost models - Depreciation cost models - Availability – cost – model of parallel systems

UNIT- V

Reliability management: Reliability programming - Management policies and decision - Reliability management by objectives - Reliability group - Reliability data: Acquisition and analysis - Managing people for reliability.

TEXT BOOKS;

1. Reliability Engineering: Balaguruswamy, Tata McGrawHill
2. Reliability Engineering: L.B.Srinath, East West Publications.

REFERENCE BOOKS:

1. Reliability Engineering: Patrick DTO, Wiley Conor-India
2. Reliability Engineering and life testing, Naikan-PHI Publications.

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SPECIAL MANUFACTURING PROCESS
(OPEN ELECTIVE-III)

Course Objectives:
The Student will :

1. To expose the students to a variety of manufacturing processes including their typical use and capabilities.
2. To teach the important effects that manufacturing processes may have on the material properties of the processed part with a focus on the most common processes.
3. To teach the thermal and mechanical aspects, such as force, stress, strain, and temperature, of the most common processes.
4. To provide a technical understanding of common processes to aid in appropriate process selection for the material and required tolerances
5. To provide a technical understanding of common processes to aid in appropriate material selection for a predetermined process

UNIT I: Casting: Steps involved in making a casting – Advantage of casting and its applications; Patterns – Pattern making, Types, Materials used for patterns, pattern allowances and their construction; Properties of moulding sands. Methods of Melting – Crucible melting and cupola operation – Defects in castings; Casting processes – Types – Sand moulding, Centrifugal casting, die- casting, Investment casting, shell moulding; Principles of Gating – Requirements – Types of gates, Design of gating systems – Riser – Function, types of Riser and Riser design. Solidification of casting – Solidification of pure metal – Nucleation and grain growth, casting design considerations.

UNIT II: Welding: Classification – Types of welds and welded joints; Gas welding – Types, oxy-fuel gas cutting – standard time and cost calculations. Arc welding, forge welding, submerged arc welding, Resistance welding, Thermit welding.

UNIT III: Inert Gas Welding _ TIG Welding, MIG welding, Friction welding, induction welding, explosive welding, Laser Welding; Soldering and Brazing; Heat affected zone in welding. Welding defects – causes and remedies; destructive and non- destructive testing of welds.

UNIT IV: Hot working, cold working, strain hardening, recovery, recrystallisation and grain growth. Rolling fundamentals – theory of rolling, types of Rolling mills and products. Forces in rolling and power requirements Stamping, forming and other cold working processes. Blanking and piercing – Bending and forming – Drawing and its types – wire drawing and Tube drawing – coining – Hot and cold spinning. Types of presses and press tools. Forces and power requirement in the above operations.

UNIT V: Extrusion of Metals: Basic extrusion process and its characteristics. Hot extrusion and cold extrusion – Forward extrusion and backward extrusion – Impact extrusion – Extruding equipment – Tube extrusion and pipe making, Hydrostatic extrusion. Forces in extrusion Forging Processes: Forging operations and principles – Tools – Forging methods – Smith forging, Drop Forging – Roll forging – Forging hammers: Rotary forging – forging defects – cold forging, swaging, Forces in forging operations.

TEXT BOOKS :

1. Manufacturing Technology / P.N. Rao Vol.1 & 2 / Mc Graw Hill
2. Manufacturing Engineering & Technology / Serope Kalpakjian / Steven R. Schmid /Pearson

REFERENCES:

1. Metal Casting / T.V Ramana Rao / New Age
2. Production Technology / G. Thirupathi Reddy / Scitech

Course outcomes:

The student will be able to:

1. Understand the idea for selecting materials for patterns. Types and allowances of patterns used in casting and analyze the components of moulds.
2. Design core, core print and gating system in metal casting processes
3. Understand arc, gas, solid state and resistance welding processes.
4. Develop process-maps for metal forming processes using plasticity principles.
5. Identify the effect of process variables to manufacture defect free products

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PRINCIPLES OF COMPUTER COMMUNICATION AND NETWORKS

(Open Elective-III)

Course Objectives:

1. To understand the Analog and Digital Communication concepts.
2. To understand the concept of computer communication.
3. To learn about the networking concept, layered protocols.
4. To understand various communications concepts.
5. To get the knowledge of various networking equipments.

UNIT-I

Analog and Digital Communication Concepts: Representing data as analog signals, representing data as digital signals, data rate and bandwidth reduction, Digital Carrier Systems.

UNIT II

Overview of Computer Communications and Networking: Introduction to Computer Communications and Networking, Introduction to Computer Network, Types of Computer Networks, Network Addressing, Routing, Reliability, Interoperability and Security, Network Standards, The Telephone System and Data Communications.

UNIT III

Essential Terms and Concepts: Computer Applications and application protocols, Computer Communications and Networking models, Communication Service Methods and data transmission modes, analog and Digital Communications, Speed and capacity of a Communication Channel, Multiplexing and switching, Network architecture and the OSI reference model.

UNIT IV

Physical and data link layer Concepts: The Physical and Electrical Characteristics of wire, Copper media, fiber optic media, wireless Communications. Introduction to data link Layer, the logical link control and medium access control sub-layers.

UNIT V

Network Hardware Components: Introduction to Connectors, Transreceivers and media convertors, repeaters, network interference cards and PC cards, bridges, switches, switches Vs Routers.

TEXT BOOKS:

1. Computer Communications and Networking Technologies, Michel A. Gallo and William H. Hancock, Thomson Brooks / Cole.
2. Data Communications and Networking – Behrouz A. Forouzan, Fourth Edition MC GRAW HILL EDUCATION, 2006.

REFERENCE BOOKS:

1. Principles of Computer Networks and Communications, M. Barry Dumas, Morris Schwartz, Pearson.
2. Computer Networking: A Top-Down Approach Featuring the Internet, James F. Kurose, K. W. Ross, 3rd Edition, Pearson Education.

Course Outcomes: The student will be able to

1. explain the networking of computers and data transmission between computers.
2. exposure about the various communication concepts.
3. get awareness about the structure and equipment of computer network structures.
4. illustrate the Physical and data link layer concepts.
5. get knowledge about network hardware components.

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SPEECH PROCESSING
(Open Elective-III)

Course Objectives:

1. To introduce speech production and related parameters of speech.
2. To show the computation and use of techniques such as short time Fourier transform, linear predictive coefficients and other coefficients in the analysis of speech.
3. To understand different speech modeling procedures such as Markov and their implementation issues.
4. To understand the basic concepts of speech recognition.
5. To gain knowledge on speech synthesis.

UNIT- I :BASIC CONCEPTS:
Speech Fundamentals: Articulatory Phonetics – Production and Classification of Speech Sounds; Acoustic Phonetics – acoustics of speech production; Review of Digital Signal Processing concepts; Short-Time Fourier Transform, Filter-Bank and LPC Methods.

UNIT- II: SPEECH ANALYSIS:
Features, Feature Extraction and Pattern Comparison Techniques: Speech distortion measures – mathematical and perceptual – Log Spectral Distance, Cepstral Distances, Weighted Cepstral Distances and Filtering, Likelihood Distortions, Spectral Distortion using a Warped Frequency Scale, LPC, PLP and MFCC Coefficients, Time Alignment and Normalization – Dynamic Time Warping, Multiple Time – Alignment Paths.

UNIT- III: SPEECH MODELING:
Hidden Markov Models: Markov Processes, HMMs – Evaluation, Optimal State Sequence – Viterbi Search, Baum-Welch Parameter Re-estimation, and Implementation issues. Speech Recognition: Large Vocabulary Continuous.

UNIT- IV: SPEECH RECOGNITION:
Architecture of a large vocabulary continuous speech recognition system – acoustics and language models – ngrams, context dependent sub-word units; Applications and present status.

UNIT –V: SPEECH SYNTHESIS:
Text-to-Speech Synthesis: Concatenative and waveform synthesis methods, sub word units for TTS, intelligibility and naturalness – role of prosody, Applications and present status.

Text Books:

1. Lawrence Rabiner and Biing-Hwang Juang, “Fundamentals of Speech Recognition”, Pearson education, 2003.
2. Daniel Jurafsky and James H Martin, “Speech and Language Processing – An Introduction to Natural language Processing, Computational Linguistics, and Speech Recognition”, Pearson Education, 2002.

References:

1. Steven W. Smith, “The Scientist and Engineer‟s Guide to Digital Signal Processing”, California Technical Publishing, 1997.
2. Thomas F Quatieri, “Discrete-Time Speech Signal Processing – Principles and Practice”, Pearson Education, 2004.

Course Outcomes:

Upon completion of the course, students will be able to:

1. model speech production system and describe the fundamentals of speech.
2. extract and compare different speech parameters.
3. choose an appropriate statistical speech model for a given application.
4. design a speech recognition system.
5. use different speech synthesis techniques.

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SOFT COMPUTING
(Open Elective-III)

Course Objectives:
Student will:

1. Classify the fundamental theory and concepts of neural networks, neuro-modeling, several neural network paradigms and its applications
2. Develop the understanding concepts of fuzzy sets, knowledge representation using fuzzy rules, approximate reasoning, fuzzy inference systems, and fuzzy logic control and other machine intelligence applications of fuzzy logic.
3. To understand the basics of an evolutionary computing paradigm known as genetic algorithms and its application to engineering.
4. Decribe fuzzy systems with membership functions
5. Determine the genetic algorithms, its applications and advances.

UNIT-I:
Introduction: Neural Networks, Fuzzy Logic, Genetic Algorithms, Hybrid Systems, Soft Computing, Soft Computing Constituents, Soft Computing Characteristics. Artificial Neural Networks: Introduction, Fundamental Concept, Evolution of Neural Networks, Basic models of ANN, Important Terminologies.

UNIT-II:
Supervised Learning Networks : Introduction, Perceptron Networks, Adaptive Linear Neuron, Back propagation Network. Associative Memory Networks : Introduction, Training Algorithms for pattern association and Hopfield Networks.

UNIT-III:
Unsupervised Learning Network : Introduction, Fixed Weight Competitive Nets, Kohonen Self-Organizing Feature Maps, Counter Propagation Networks.
Fuzzy Sets : Introduction, Classical Sets, Fuzzy Sets, Classical Relations, Fuzzy Relations

UNIT-IV:
Membership functions- Features, Fuzzification, Membership value assignments, Defuzzification Methods, Fuzzy Arithmetic, Fuzzy Measures, Fuzzy Inference Systems, Fuzzy Logic Control Systems

UNIT-V:
Genetic Algorithms- Introduction, Basic operators and terminology, Traditional Algorithm vs Genetic Algorithm, Simple GA, General GA, Classification of GA, Genetic Programming, Applications of GA.
Applications of Soft Computing : Internet Search Technique, Hybrid Fuzzy Controllers.

TEXT BOOKS:

1. Principles of Soft Computing- S N Sivanandam, S N Deepa, Wiley India, 2007
2. Neuro-Fuzzy and Soft Computing A Computational Approach to Learning and Machine Intelligence – J.S.R.Jang, C.T.Sun, E.Mizutani, PHI 177

REFERENCE BOOKS:

1. Artificial Intelligence and Soft Computing- Behavioral and Cognitive Modeling of the Human Brain- Amit Konar, CRC press, Taylor and Francis Group.
2. Soft Computing and Intelligent System Design -Fakhreddine O Karray, Clarence D Silva,. Pearson Edition, 2004.
3. Artificial Intelligence – Patric Henry Winston – Third Edition, Pearson Education.

Course Outcomes:

Student will able to:

1. Learn about soft computing techniques and their applications
2. Analyze various neural network architectures
3. Apply perceptrons and counter propagation networks.
4. Define the fuzzy systems
5. Analyze the genetic algorithms and their applications

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E-COMMERCE
(Open Elective-III)

Course objectives:

1. Gain knowledge about the main objective and at the same time need is transaction on your web store. Of, course if you are selling products online what you require are customers. If you are getting good reach ability then your business will definitely grow. Therefore one of the objectives is high reachability.
2. Solve conversions i.e., if people are coming on your web store and purchasing something then it will calculate as conversions and from the number of people who are buying stuff from your web store we can calculate the conversion rate.
3. Provide customer satisfaction i.e., customer is the main part of any e-commerce business so it's very important to make your customer happy and satisfied by providing quality and desirable products, on time delivery, 24*7 customer support, and timely sale & best deal offers you can make your customer happy. It is one of the main objectives of e-commerce.
4. Receive social popularity i.e., unless and until you are not famous and popular among people you cannot establish your brand. Social presence with omni channel and digital marketing is essential for any e-commerce business.
5. Know about Consumer Search and Resource Discovery.

UNIT-I:
Introduction, Electronic Commerce Framework, The Anatomy of E-Commerce applications, E-Commerce Consumer applications, E-Commerce organization applications.

UNIT-II:
Consumer Oriented Applications, mercantile process models, mercantile models from the consumer's perspective, Mercantile from the merchant's perspective.
Types of Electronic Payment Systems, Digital Token-Based Electronic Payment Systems, Smart Cards & Electronic Payment Systems, Credit Card- Based Electronic Payment Systems, Risk & Electronic Payment Systems, Designing Electronic Payment Systems.

UNIT-III:
Electronic Data Interchange, EDI Applications in Business, EDI implementation, MIME, and value added networks.
Intra organizational E-Commerce, Macro forces and Internal Commerce, Work flow automation and Coordination, Customization and Internal Commerce, Supply Chain Management(SCM).

UNIT-IV:
Making a business case for a Document Library, Digital document types, Corporate Data warehouses, Advertising and Marketing, the new age of Information Based Marketing, advertising on Internet, charting the Online marketing process, Market Research.

UNIT-V:

Consumer Search and Resource Discovery, information search and Retrieval, Electronic commerce catalogs or directories, Information Filtering.

Multimedia and Digital video, Key Multimedia concepts, Digital Video & Electronic Commerce, Desktop Video Processing, Desktop Video Conferencing.

Text Books

1. "Frontiers of electronic commerce" – Kalakota, Whinston, Pearson
2. "E-Commerce", S.Jaiswal – Galgotia

References

1. Ravi Kalakota, Andrew Winston, "Frontiers of Electronic Commerce", Addison-Wesley.
2. Goel, Ritendra "E-commerce", New Age International
3. Laudon, "E-Commerce: Business, Technology, Society", Pearson Education

Course outcomes:

1. Demonstrate an understanding of the foundations and importance of e-commerce.
2. Demonstrate an understanding of retailing in e-commerce by:
    a. Analyzing branding and pricing strategies,
    b. Using and determining the effectiveness of market research.
    c. Assessing the effects of disintermediation.
3. Analyze the impact of e-commerce on business models and strategy.
4. Describe internet trading relationships including business-to-business, intraorganizational.
5. Describe the infrastructure for E-Commerce.

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INTERNET OF THINGS
(Open Elective-III)

Course Objectives

1. Understand the current vision of the Internet of Things and its impact on the world
2. Classify basic concepts of IoT and M2M &IoT system management
3. Describe concepts of python language and different python packages.
4. Explain how to design IoT Physical devices with built-ins of python Programs
5. Identify the advanced concepts of IoT physical servers, cloud offerings.

UNIT-I:

Introduction to Internet of Things –Introduction, Definition and Characteristics of IoT,
Physical Design of IoT – Things inIoT, IoT Protocols, Logical Design of IOT- IoT Functional Blocks,IoTCommunication Models, IoT Communication APIs
IoT Enabling Technologies – Wireless Sensor Networks, Cloud Computing, Big Data Analytics, Communication Protocols, Embedded Systems
Domain Specific IoTs – Introduction, Home Automation, Cities, Environment, Energy, Retail, Logistics, Agriculture, Industry, Health and Lifestyle.

UNIT-II:

IoT and M2M – Introduction,M2M,Difference between IOT and M2M,**SDN and NFV for IoT**-Software Defined Networking, Network Function Virtualization,
IoT System Management with NETCONF-YANG- Need for IoT Systems Management, Simple Network Management Protocol (SNMP), Network Operator Requirements,NETCONF, YANG, NETOPEER.

UNIT-III:

IoT Systems-Logical Design Using Python-Introduction, Installing Python, Data types and Data Structures, Control Flow, Functions, Modules, Packages, File handling, Date/Time Operations, Classes.
Python Packages of Interest for IoT- JSON, XML, HTTPLib, URLLib, SMTPLib.

UNIT-IV:

IoT Physical Devices and Endpoints – What is an IoTDevice,Exemplary Device: Raspberry Pi,About the Board,Linux on Raspberry Pi, Raspberry PI-Interfaces (Serial, SPI, I2C),Programming
Raspberry Pi with Python-Controlling LED, interfacing an LED and Switch and interfacing a light sensor with Raspberry Pi,

UNIT-V:

IoT Physical Servers and Cloud Offerings – Introduction to Cloud Storage Models and communication APIs.
WAMP-AutoBahn for IoT,Xively Cloud for IoT, Python web application framework
Designing a RESTful web API,

TEXT BOOKS:

1. Internet of Things - A Hands-on Approach, ArshdeepBahga and Vijay Madisetti, Universities Press, 2015, ISBN: 9788173719547
2. Getting Started with Raspberry Pi, Matt Richardson & Shawn Wallace, O'Reilly (SPD), 2014, ISBN: 9789350239759

Course Outcomes

1. Analyze current vision of the Internet of Things and its impact on the world.
2. Demonstrate basic concepts of IoT and M2M &IoT system management
3. Practice the concepts of python language using different python packages
4. Design IoT Physical devices using python Programming.
5. Categorize advanced concepts of IoT physical servers, cloud offerings.

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B.Tech.	**L**	**T-P-D**	**C**
IV Year II- Semester	**3**	**0-0-0**	**3**

SEMANTIC WEB AND SOCIAL NETWORKS

(Open Elective-III)

Course Objectives

1. Explain the fundamentals of Semantic Web technologies.
2. Explain the Implementation of semantic web applications and the architectures of social networking
3. Discuss which brings together forward looking research and technology that will shape our world more intimately than ever before as computing becomes an extension of human experience;
4. Discuss that covers all aspects of computing that is very closely tied to human perception, understanding and experience;
5. Discuss which brings together computing that deal with semantics, perception and experience and serves as the Plat form for exchange of both practical technologies and far reaching research.

UNIT I

Thinking and Intelligent Web Applications, The Information Age, The World Wide Web, Limitations of Today's Web, The Next Generation Web

Machine Intelligence, Artificial Intelligence, Ontology, Inference engines, Software Agents, Berners-Lee, www, Semantic Web Road Map, Logic on the semantic Web.

UNIT II

Ontologies and their role in the semantic web, Ontologies Languages for the Semantic Web - Resource Description Framework (RDF) / RDF Schema. Ontology Web Language (OWL), UML, XML and XML Schema.

Ontology Engineering, Constructing Ontology, Ontology Development Tools, Ontology Methods, Ontology Sharing and Merging, Ontology Libraries and Ontology Mapping,

UNIT III

Logic, Rule and Inference Engines. Semantic Web applications and services. Semantic Search,e-learning, Semantic Bioinformatics, Knowledge Base

UNIT IV

XML Based Web Services, Creating an OWL-S Ontology for Web Services. Semantic Search Technology, Web Search Agents and Semantic Methods,

UNIT V

What is social Networks analysis, development of the social networks analysis.Electronic Sources for Network Analysis - Electronic Discussion networks.

Blogs and Online Communities. Web Based Networks. Building Semantic Web Applications with social network features.

TEXTBOOKS:

1. Thinking on the Web - Berners Lee.Godel and Turing,Wiley interscience,20()8.
2. Social Networks and the Semantic Web, Peter Mika, Springer, 2007.

REFERENCE BOOKS:

1. Semantic Web Technologies,Trends and Research in Ontology Based Systems, J.Davies, Rudi Studer. Paul \Warren, John Wiley & Sons.
2. Semantic Web and Semantic Web Services -Liyang Lu Chapman and Hall/CRC Publishers,(Taylor & Francis Group)
3. Information Sharing on the semantic Web – Heiner Stuckenschmidt; Frank Van Harmelen, Springer Publications.

Course Outcomes

1. Demonstrate knowledge and be able to explain the three different “named” generations of the web
2. Demonstrate the ability to participate materially in projects that develop Programmes relating to **Web** applications and the analysis of Web data.
3. Analyze key Web applications including search engines and social networking sites.
4. Illustrate the key aspects of Web architecture and why these are important to the continued functioning of the World Wide Web.
5. Analyze and explain how technical changes affect the social aspects of Web-based computing.

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FUNDAMENTALS OF INTELLIGENCE SYSTEMS

(OPENELECTIVE-III)

Course Objectives:

1. Understand In-depth of specialist bodies of knowledge within the engineering discipline.
2. Establish engineering methods to complex engineering problem solving.
3. Be Fluent application of engineering techniques, tools and resources .
4. Learn the difference between optimal reasoning vs human like reasoning.
5. Understand the notions of state space representation, exhaustive search, heuristic search along with the time and space complexities

UNIT–I:

Introduction to Artificial Intelligence: Introduction to AI-Problem formulation, Problem Definition -Production systems

Control strategies, Search strategies. Problem, characteristics, Production system characteristics -Specialized production system

UNIT–II:

Representation of Knowledge: Game playing - Knowledge representation, Knowledge representation using Predicate logic, Introduction to predicate calculus, Resolution

Use of predicate calculus, Knowledge representation using other logic Structured representation of knowledge.

UNIT–III:

Knowledge Inference: Knowledge representation Production based system, Frame based system

UNIT–IV:

Inference - Backward chaining, forward chaining, Rule value approach Fuzzy reasoning - Certainty factors, Bayesian Theory-Bayesian Network-Dempster - Shafer theory.

UNIT-V:

Expert Systems: Expert systems - Architecture of expert systems

Roles of expert systems - Knowledge Acquisition –Meta knowledge, Heuristics.

Text Books:

1. Kevin Night, Elaine Rich, Nair B., “Artificial Intelligence (SIE)”, Tata McGraw-Hill Education Private Limited, 3rd edition, 2009, ISBN: 978-0070678163.
2. Dan W. Patterson, “Introduction to AI and ES”, Pearson Education, 2nd edition, 2007.ISBN, 0132097680.

Course Outcomes:

1. Gain basic understanding of the underlying principles and philosophy of computational intelligence systems Technologies.
2. Be capable of constructing intelligent systems (in software) that perform useful engineering tasks.
3. Possess the ability to formulate an efficient problem space for a problem expressed in English.
4. Possess the ability to select a search algorithm for a problem and characterize its time and space complexities.
5. Possess the skill for representing knowledge using the appropriate technique.

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INTRODUCTION TO NEURAL NETWORKS

(OPEN ELECTIVE-III)

Course Objectives:

1. Understand the differences and similarities neural network, human brain and feedback systems
2. Learn the different learning techniques
3. Familiar with the concept of single layer perceptron and its algorithms.
4. Familiar with the concept of multilayer perceptron and its algorithms
5. Know the self-organisation mapping techniques.

UNIT–I:

Introduction: What is a neural network? Human Brain, Models of a Neuron, Neural networks viewed as Directed Graphs

Network Architectures, Knowledge Representation, Artificial Intelligence and Neural Networks.

UNIT–II:

Learning Process: Error Correction learning, Memory based learning, Hebbian learning, Competitive, Boltzmann learning

Credit Assignment Problem, Memory, Adaption, Statistical nature of the learning process.

UNIT–III:

Single layer perceptrons: Adaptive filtering problem, Unconstrained Organization Techniques, Linear least square filters, least mean square algorithm, learning curves

Learning rate annealing techniques, perception-convergence theorem, Relation between perception and Bayes classifier foe a Gaussian Environment.

UNIT–IV:

Multilayer Perceptrons: Back propagation algorithm XOR problem

Heuristics, Output representation and decision rule, computer experiment, feature detection.

UNIT-V:

Self –Organization Maps: Two basic feature mapping models, Self-Organization maps, SOM algorithm.

Hopfield models: Hopfield models, computer experiment.

Text Books:

1. Neural networks A comprehensive foundation, Simon Haykin, PHI edition.
2. Artificial neural networks- B. Vegnanarayana Prentice Halll of India P Ltd 2005.

Reference Books:

1. Neural networks in Computer intelligence, Li Min Fu TMH 2003.
2. Neural networks James A Freeman David M S kapura. Pearson education 2004.

Course Outcomes:

1. Know differences and similarities between neural network, human brain and feedback systems
2. Get the knowledge of different learning techniques
3. Describe the concept of single layer perceptron and its algorithms.
4. Describe the concept of multilayer perceptron and its algorithms.
5. Analyse the self-organisation mapping techniques.